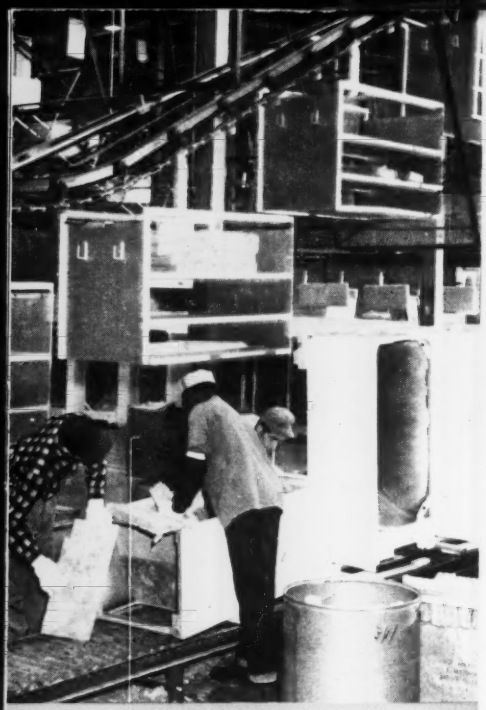


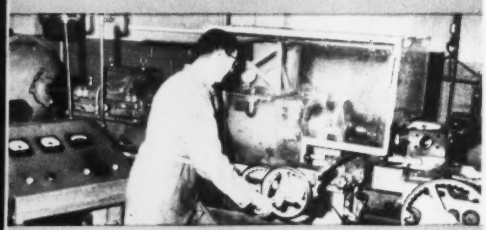
DECEMBER 15, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

How Appliance Outlook Brightens

Manufacturers see 5 to 10 per cent increase over 1958 sales next year, but price fighting tempers optimism, keeps profits low ..... *Page* 83



Making Ceramic Tools Work

Here are ten rules that can get you off to the right start. Two examples: An edge land on the cutter is a must; long cuts mean long life ..... *Page* 128

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Metalworkers Plan To Expand Their Capacity 2.6% in 1959

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Memphis Reversal Spurs Pipe

Page 93 ...
Why Scrap Sellers Seek U. S. Aid

Page 133 ...
Machine Service Unit Gets Rid of Costly Production Downtime

Page 150 ...
Loose Abrasives Give Fast Finish

Page 179 ...
Structural Aluminum Begins Move

it's mainly a matter of TIMING!

When an old machine costs you more than it earns, replacement pays for itself!

There comes a time in the life of any machine, when it will no longer produce at a profit — a time beyond which its continued use represents a *financial loss* to your company. This point of obsolescence may be the result of physical aging or of technological advances. In either case, the result is the same — money wasted that could be *saved* by the investment in a new machine.

Determining *when* to replace a machine is too important for guesswork or rule-of-thumb computations. Only precise methods of comparative cost analysis will give you the right answer. Our sales engineers are well experienced in making obsolescence studies and will be glad to do the same for you. Similar studies have pointed the way to many important savings.

For Example: A manufacturer of aircraft instruments had been using a 5-year-old precision lathe to perform boring, turning and facing operations on instrument cases. But when this was replaced with a new Heald Model 0 Unit-Type Bore-Matic like that shown at the right, operating costs for the same production were immediately reduced by over 78%. In addition, the elimination of a separate burring operation and reduced assembly time made further important savings, as indicated by the cost analysis below.

	Old Machine	New Machine
Parts per hour	4.3	20
Parts per year (Req'd. Prod.)	10,000	10,000
Direct and Indirect Labor, per year	$20,349	$ 6,055
Scrap Losses, per year	$ 500	$ 300
Annual Maintenance Cost	$ 600	$ 300
Annual Operating Cost	$21,449	$ 6,655
Basic Annual Saving, New Machine		$14,794
Additional Saving from elimination of separate operation		$ 500
Additional Saving from reduced assembly time		$ 1,500
Total Saving Per Year		$16,794
Return on Investment for New Machine		84%

YOU pay for obsolescence. Replacement pays for itself!

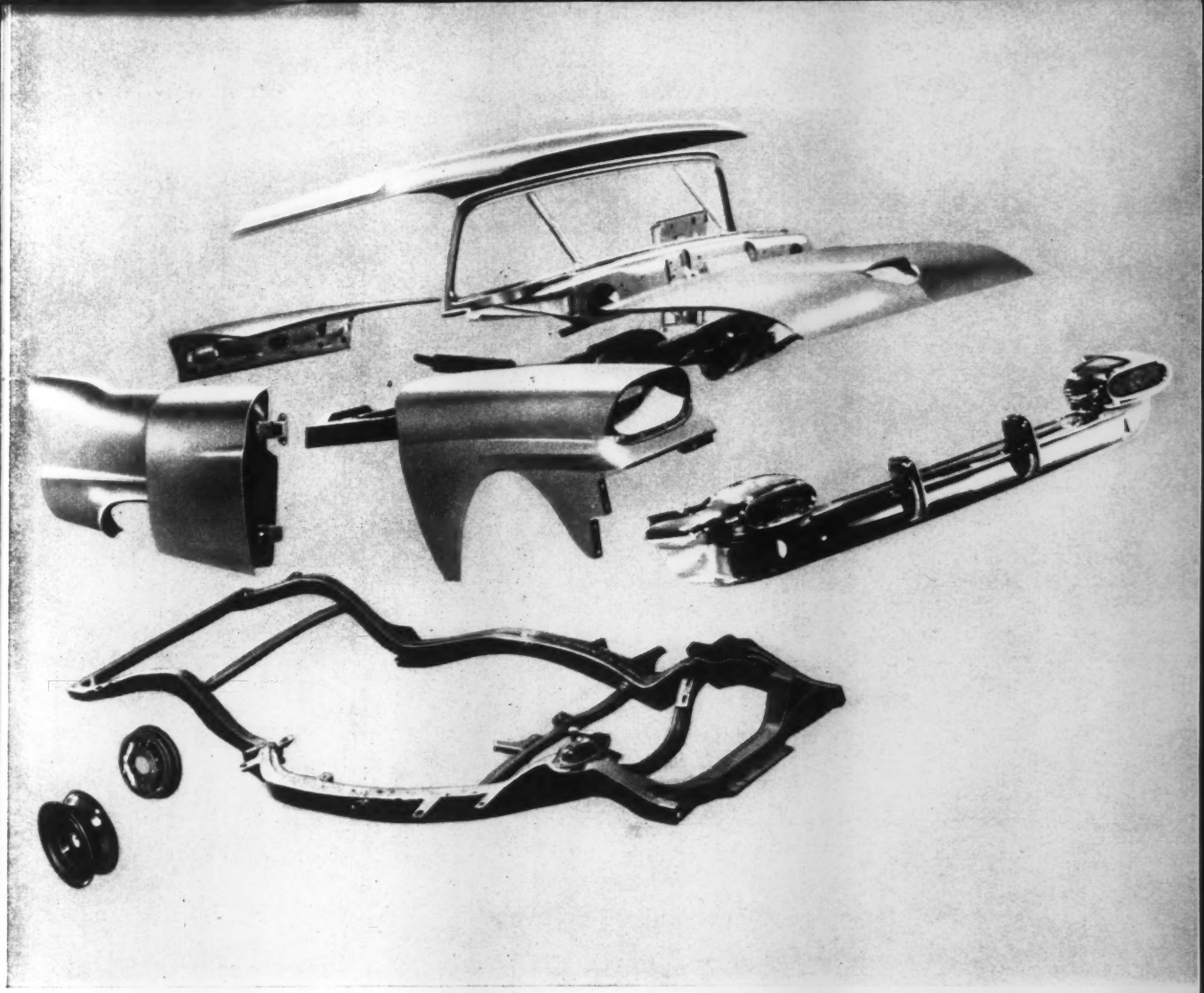
THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Indianapolis • New York

HEALD



Your car is about 70 pct sheet steel

The biggest safety feature of today's automobile is the rugged strength of the sheet steel in its frame and body. Yet rigid and tough as sheet steel is, it is also amazingly plastic. Between the dies of a press it literally flows. Fenders, bumpers, decks conform precisely to the designer's dream. One giant punch, and a rugged, one-piece roof panel emerges, ready for the assembly line.

Thousands of tons of Bethlehem hot-rolled and cold-rolled steel sheets go into parts, components and sub-assemblies of American automobiles. Bethlehem sheets are as uniform and as finely made as any on the market.

If you work with sheets, perhaps we can help you turn a problem into a profit. For prices and deliveries, just get in touch with the nearest Bethlehem office.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM STEEL

Every fastener we make is statistically quality controlled ...even though made in the millions. Only the most modern methods and equipment are used. When you ask for Lamson fasteners – whether standards or specials – you know you're getting the very best. Men who make decisions involving company money have come to expect and depend on this kind of product from us.

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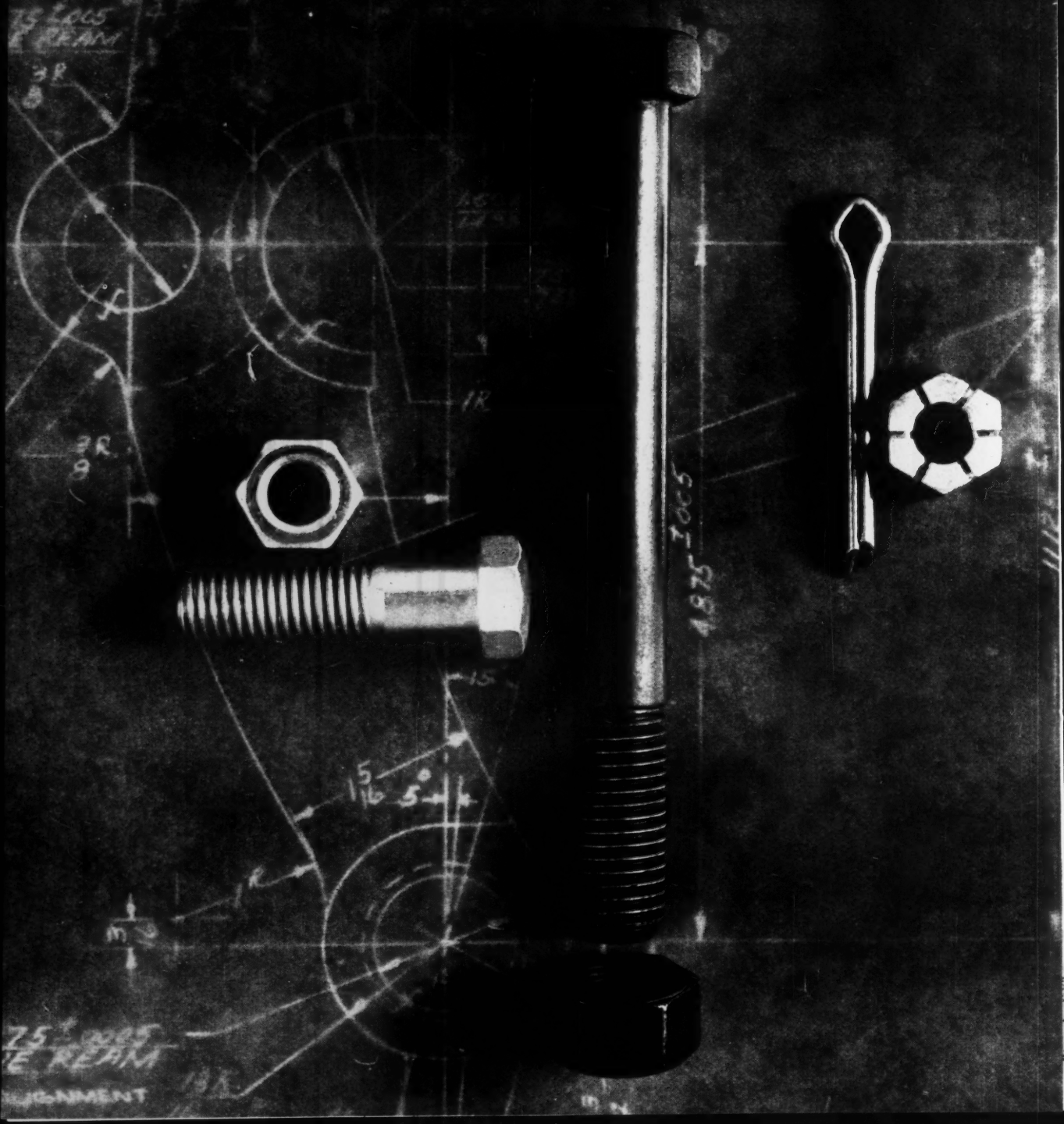
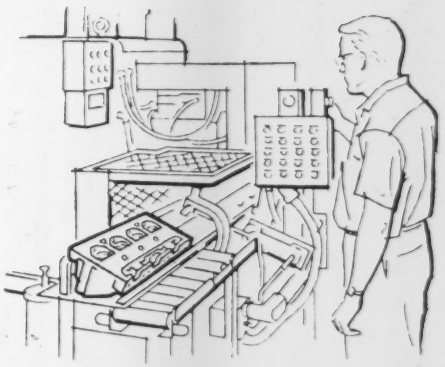
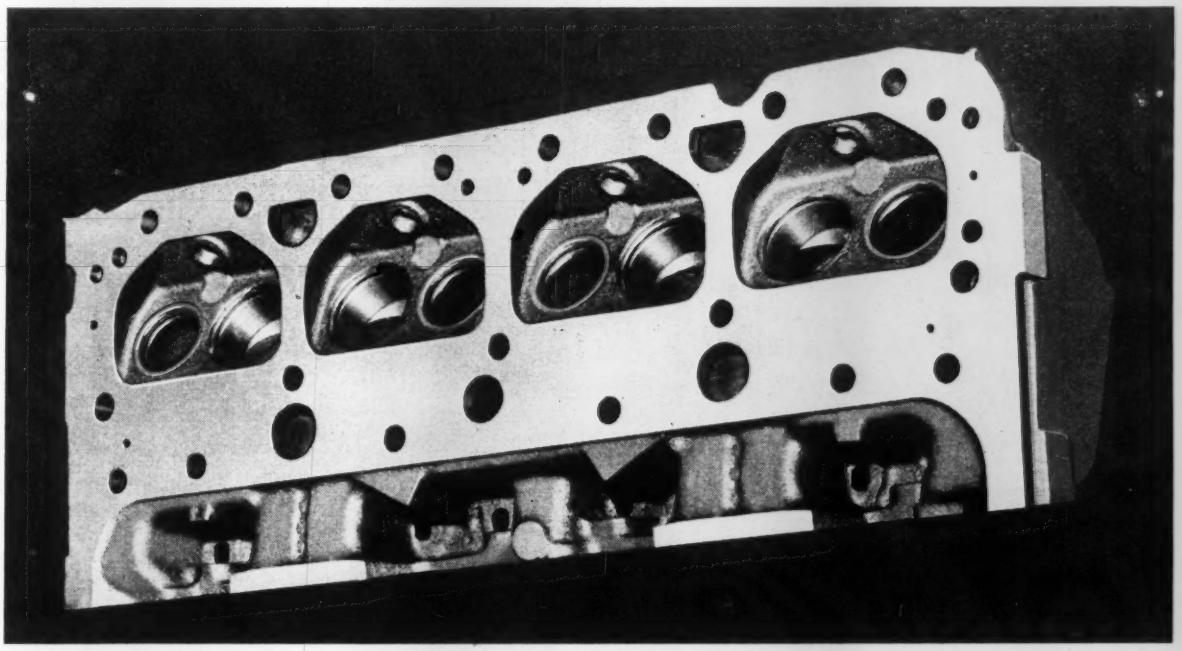


TOCCO Hardening of Exhaust Valve Seats



Saves Cost of Expensive Alloy Inserts



• *In just 12.5 seconds* the four valve seats on this heavy-duty truck cylinder head are heated to 1650°F. An area of ⅜" perpendicular to the valve seat is hardened to a minimum of 42 Rockwell C. TOCCO's uniform, localized hardening permits the elimination of costly alloy inserts. The cost of induction hardening is a small fraction of the cost of these alloy inserts.

This unusual application indicates the wide scope of cost-saving possibilities available through the educated use of TOCCO Induction Heating. If your products require hardening, heating for forming or brazing, it's better than an even bet that TOCCO Engineers can save you money.

TOCCO

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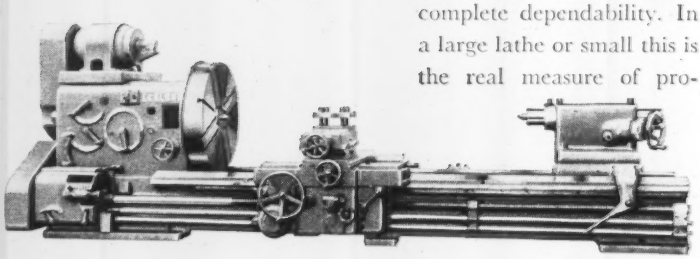

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CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

This Week in STEEL The Metalworking Weekly

December 15, 1958
Vol. 143 No. 24

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Top brass should get out into the field to cultivate top-level contacts, gather first-hand facts.

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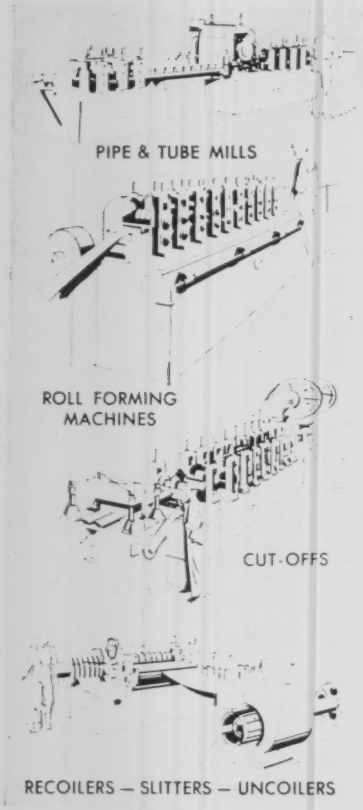

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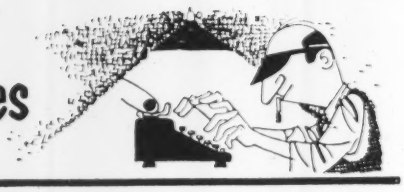


The Loaded Question

This morning we were reminded of the fable about the benevolent and sagacious king who yearned to improve his government. Aware that his ministers were too cagey to tell the truth, he summoned his jester. "Good varlet," quoth he, radiating the soft and innocent sheen associated with a tub of butter, "pray tell me exactly what you think of me." The court fool d'd a double take, then registered alarm. "Your majesty, if I speak frankly, you'll throw me to the royal wolves, so please excuse me. Perhaps her majesty, the queen . . ."

"Tut, tut and tut!" exclaimed the genial and enlightened monarch. "Feel perfectly free to speak your mind. This is self-improvement week, you know, and I'd like to have your honest opinion. Come, now; what do you really think of me?"

"Your majesty," said the fool, "you simply stink!"

"Throw this idiot to the wolves!" the king screamed. So the wolves gobbled up the poor jester, and a new moral spread throughout the kingdom: Be sure you're right, and then be sure to keep your trap shut.

Nothing but the Truth

Now, the editors of STEEL yearn after improvement, too. Sometimes they ask readers for opinions. On the morning the king came to mind, the editors had invited an average reader to attend a meeting. "Good sir," said the chairman, "we would like to have your honest opinion. Please tell us what you really think of STEEL."

The reader, James Bateman, president of Spiral Brushes Inc., Cleveland, producer of industrial brushes, did a double take, then registered mild concern. "You mean, you want me to tell you exactly what I think? Well, I confess I miss some copies entirely." Everybody grinned and relaxed; here was an honest critic.

Penetrating questions and sensible answers flashed back and forth over a period of an hour, and Editorial Assistant Jane Wedge, who was delegated to make a shorthand report of the meeting, almost ran out of note paper. Some of the questions drew unexpected answers. Mr. Bateman was asked if he favored the practice of permitting employees to read business publications on company time. "In my opinion," he chuckled, "the only reading material that might tempt some employees is comic books." He did say, however, that he frequently directed the attention of certain supervisory personnel to specific articles in STEEL.

Machine Tool Editor Robert Huber wanted to know what Mr. Bateman liked best in the magazine. "I mean, do you like news, or technical stuff, or prices? What do you read first?"

The Average Reader reacted perfectly. "I just flip through the magazine, like this, and when something rings a bell, I stop and read."

Somebody wanted to learn what made the bells ring. "Two things," said Mr. Bateman. "First, is it an application that we can use in our company? Second, is it an application that can be used in a company that uses our products? You see, I'm a selfish reader."

Market Editor Bill Rooney wondered if Mr. Bateman spent much time in the back of the magazine, deep in the price columns. STEEL's price pages are a standard in the metalworking industry; you can find in these dozens of digits the price of almost anything in the business, from shovel turnings to tight cooperage hoops. "Never get back there," said Mr. Bateman blandly. "The only prices that interest me are brush prices."

From prices we switched to Chinese pig bristles because somebody mentioned foreign competition, and this is as good a time as any to talk about Chinese pig bristles. Sort of varies the routine, doesn't it? "The finest paint brushes in the world," explained Mr. Bateman, "are made from Chinese pig bristles. Naturally, they come from China, but we don't recognize Communist China, so we can't get the bristles any more. However, England recognizes Communist China; the English get all the bristles they want, and they make pig bristle brushes and sell them over here cheaper than we could make them, even if we had the Chinese pig bristles, which we don't."

Brushes up on Vital Stuff

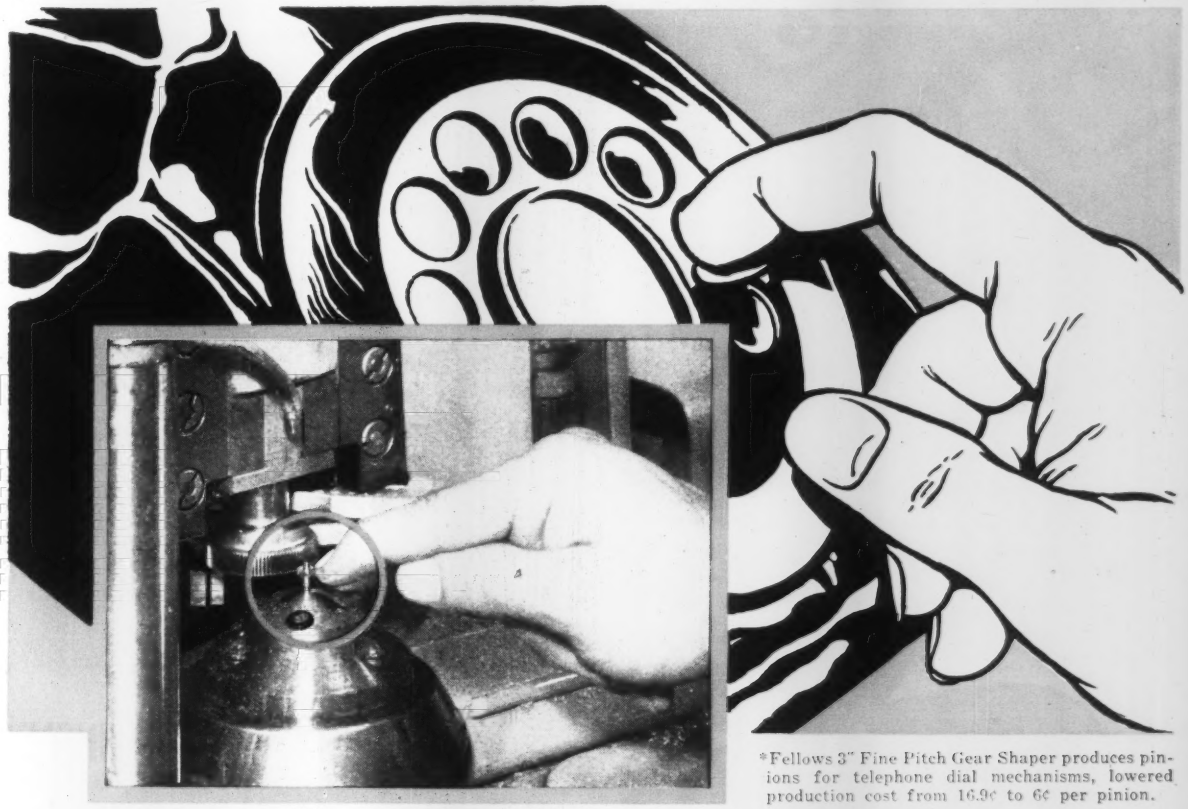
About 390 companies make industrial brushes, which Mr. Bateman defines as "power driven bristly tools that deburr, polish, clean, or shape products." He built up his company since the war, and when he reads STEEL, he seeks nothing but pertinent information.

"Speaking for myself," he concluded, "I read only items and ads that refer in some way to industrial brushes, or to the improvement of our business. I like your Program for Management series, the stories and reports on depreciation, and anything on new products. Your new covers are good, too, and I think you have done a fine job with the four-page Metalworking Outlook."

You might say that we asked Mr. Bateman to step up and deliver his 2 cents' worth, but darned if it didn't turn out to be $2 worth, instead!

Shrdlu

(Metalworking Outlook—Page 73)



*Fellows 3" Fine Pitch Gear Shaper produces pinions for telephone dial mechanisms, lowered production cost from 16.9¢ to 6¢ per pinion.

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HEAT-TREATED HEADS are designed for the utmost economy when doing commercial threading, and will produce threads to Class 2 and 3 fits. The initial cost is small and rugged construction ensures trouble-free operation and few repairs. Wide range coverage requires minimum tool inventories, and along with the use of LANDIS Tangential Chasers allows maximum output per dollar of tool cost.

LANDIS Tangential Chasers are an important factor both in the economy and precision of these basic head styles. These chasers may be replaced or re-ground singly, can be used for 80% of their original length, and allow either style of die head to produce threads of the accuracy for which it is recommended.

LANDIS manufactures more than 100 sizes and types of standard and special Die Heads for use on threading machines, turret lathes, tapping machines and bar automatics. Let us suggest the Head most suitable for your needs—send specifications and ask for Bulletins F-80 and F-90.

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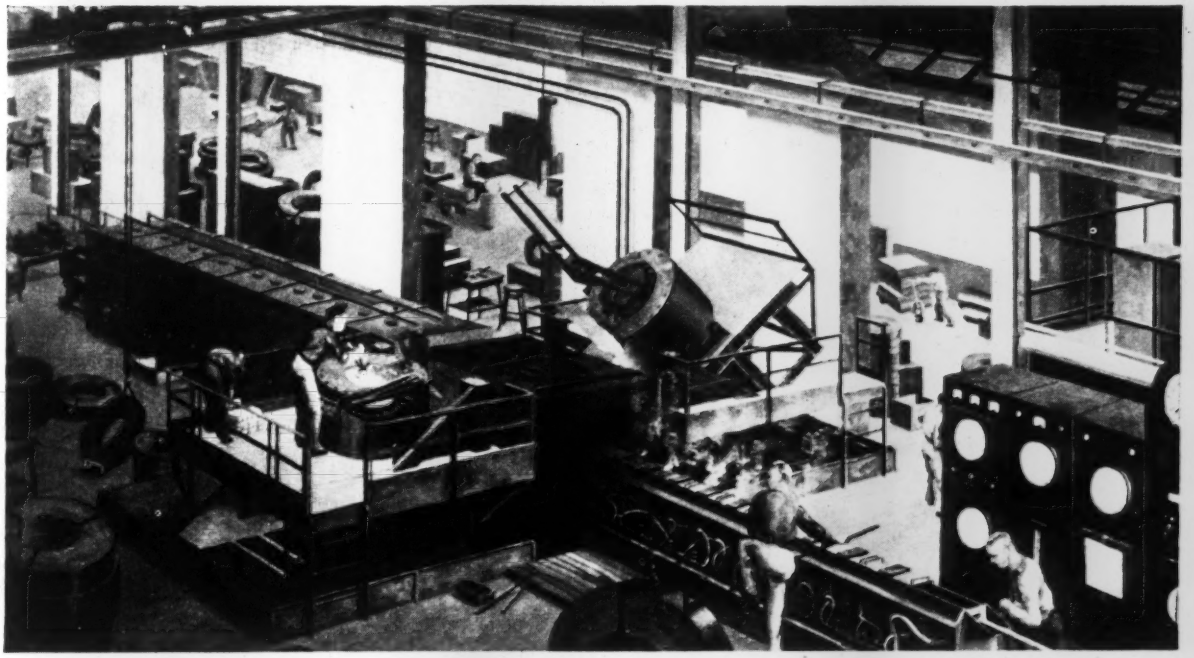

60 CYCLE INDUCTION MELTING OF HIGH LEADED BRONZES

15 years ago, THE CLEVELAND GRAPHITE BRONZE COMPANY, division of CLEVITE CORPORATION, pioneered 60 CYCLE INDUCTION MELTING of bronzes with up to 35% lead. Special furnaces developed by AJAX for this difficult job are an important element in their unique continuous production line for steel-backed bronze bearing strip. 60 CYCLE INDUCTION MELTING furnaces resulted in substantial improvements and cost savings over gas-fired units used earlier for that purpose. Today, CLEVITE operates six continuous lines in this country and abroad with AJAX 60 CYCLE INDUCTION MELTING furnaces, producing enough strip to make 130 million bearings and bushings per year.

The heavy duty 60 cycle inductor developed by AJAX and pioneered by CLEVITE will attain a lining life of one year with bronzes of substantial lead content. Electromagnetic stirring assures uniform alloy and close temperature control. Compared to externally fired equipment, metal loss savings run into many thousands of dollars per year. Recently, several large producers of leaded bronze castings converted their foundries entirely to 60 CYCLE INDUCTION MELTING.

While this is one of the most difficult metals to handle, the advantages of 60 CYCLE INDUCTION MELTING stand out today wherever copper alloys are melted. As specialists in 60 CYCLE INDUCTION MELTING, we have developed furnace types to best fill each application.

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This new H-25 PAYLOADER®

replaced two tractor-shovels

Lawrence Parker, Supt. of Rollstone Foundry, Inc., Fitchburg, Mass., says, "We recently replaced two other loaders with the new H-25 'PAYLOADER'. It has cut our overall work period in the night crew operation from 11 hours to 6 hours without changing floor working conditions. Its short turning radius enables it to work in close areas not possible with the two other units. Engine power is geared for operating conditions better than any other loader previously worked or demonstrated in our plant."

16 hours a day

Specializing in gray iron, steel and stainless castings, Rollstone keeps the Model H-25 busy 16 hours a day throughout the foundry. It moves castings, unloads new sand, handles coke, cleans sand from the floor, feeds the sand cutter and molding stations, removes refuse.

Maximum carry capacity

The Model H-25 with a carry capacity of 2,500 lbs. can carry more load for its weight than any tractor-shovel near its size.

Fast, easy operation

The only machine in its class with power-shift transmission having two speeds forward *and* reverse, power-steer for fast, easy operation.

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In order to insure long life and low maintenance, full protection is provided by triple air cleaner, three cartridge-type oil filters and oil and grease seals on all vital points.

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LETTERS TO THE EDITORS

Sheldon's Headache Helps

May I have a copy of "The Revolt of Sheldon Schmaltz" (Nov. 24, p. 68)? There is a lot of negative philosophy, if you will excuse the term, in the ten items at the end of the article.

Thank you, and may we have more reminders of the value of advertising.

Francis J. Hall
Chief Draftsman
Titanium Metals Corp. of America
Toronto, Ohio

• • •

We wish to compliment you on your fine article. Please send a reprint to our advertising manager.

H. S. Hill
Manager of Sales
Tennessee Coal & Iron Div.
U. S. Steel Corp.
Tulsa, Okla.

• • •

Your article was a good one. We would appreciate receiving as many extra copies of it as possible.

G. K. Iwashita
Manager—Advance Planning
Metals Processing Div.
Curtiss-Wright Corp.
Buffalo

Reciprocity: Not So Good

I have read "Reciprocity Can Be Good" (Nov. 17, p. 55).

Recently, one of the large steel manufacturers did not invite a distributor of ours to quote prices on equipment because it claimed we did not use its product while some of our competitors did.

Inasmuch as small manufacturers are unable to buy in carload lots and depend on local sources of supply, it is a little hard for me to understand how this steel company could possibly know we didn't use its product. We buy steel from the local distributors who are in a position to deliver what we want when we want it. It is immaterial to us where it comes from.

If reciprocity is a good thing, why not extend it to stockholders as well as customers. Instruct purchasing agents to buy from manufacturers whose officers hold stock in their companies rather than

(Please turn to Page 12)

"We've cut stainless costs with ferromanganese-silicon"

Ferromanganese-silicon allows savings of as much as $8 per ton, depending upon practice, in the production of high-manganese stainless steels. It also reduces manganese costs for the chromium-nickel grades of stainless.

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Ferromanganese-silicon gives lower costs, rapid solubility, and high manganese recoveries.

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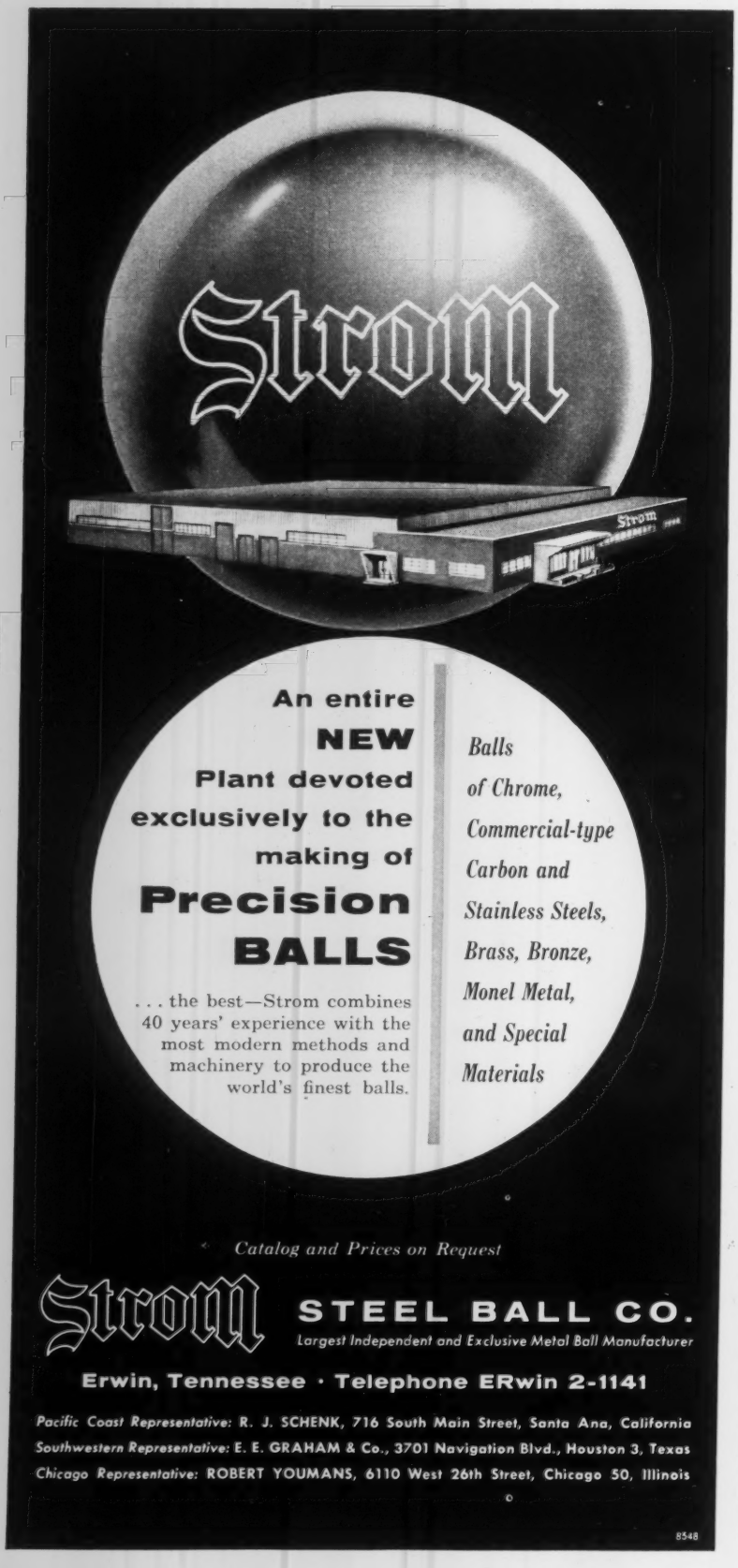
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Chicago Representative: ROBERT YOUMANS, 6110 West 26th Street, Chicago 50, Illinois
8548

LETTERS

(Concluded from Page 10)

buying from manufacturers whose executives have no stock interest.

I feel this matter of reciprocity can be overdone and yet, I might agree that there is some merit in it where a small manufacturer like ourself has used a product exclusively for 30 or 35 years.

It is an interesting discussion.

B. C. Saunders
Secretary & Sales Manager
Gallmeyer & Livingston Co.
Grand Rapids, Mich.

Planning Needed for New Boom

I not only read "Get Ready for the New Boom" (Nov. 17, p. 97) but I have forwarded it to all of our top management team here at Parker-Kalon.

You have done a wonderful job in bringing the gross potential in industry to executives' attention. I agree with you that of greatest importance is the planning and organization which must go into preparations for such growth.

W. T. Ylvisaker
President
Parker-Kalon Div.
General American Transportation Corp.
Clifton, N. J.

• • •

I read your article with much interest. You have done an excellent job of pinpointing the approaches which have been used by a number of companies.

Louis S. Drake
Manager
Economic Research
Calumet & Hecla Inc.
Chicago

• • •

This final report in the 1958 Management Series is one of the best in an excellent series.

E. Bytwerk
Manager
Marketing Div.
Manning, Maxwell & Moore Inc.
Muskegon, Mich.

Shorter Sermons Perhaps?

I would greatly appreciate a reprint of "Memo to Busy Executives—How To Save Time" (Nov. 10, p. 86).

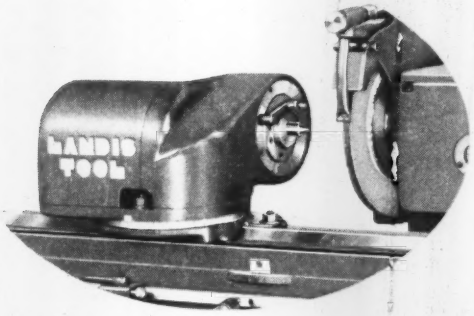
Vance L. Eckstrom
Pastor
Prince of Peace Lutheran Church
La Mirada, Calif.

Praises Russian Articles

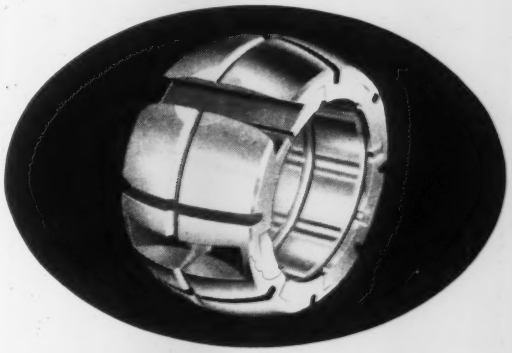
I would like to compliment you on the fine editorials and articles written on Russia. "Russia's Biggest Weapon?" (Nov. 24, p. 55) is a good example. You can do a great deal to continue to alert our people to the present and coming struggle with Communism. Thanks again.

Dennis J. Carney
Division Superintendent
Steel Producing
U. S. Steel Corp.
Duquesne, Pa.

Low cost general purpose grinder with 2 exclusive "big grinder" features...



Variable speed headstock... compact design with only two revolving parts. Can be swiveled for angle or face grinding.



Microsphere bearings... close running clearance of Landis Microsphere spindle bearings gives faster spark-out, accurate, quick response to wheel feed.

LANDIS 12" x 28" Grindwell Universal ... compact, precision grinder for manufacturing, maintenance, toolroom and training.

LANDIS
precision grinders
LANDIS TOOL COMPANY / WAYNESBORO, PENNA.

New Materials Handling Ideas from Republic

SAVE SPACE, CUT COSTS, IMPROVE INVENTORY CONTROL

VALUABLE FLOOR SPACE is saved at Dresser Industries by special tiering feature of Republic Box and Skid Units. Tiering lugs are securely welded to boxes permitting stacking to any practical height.

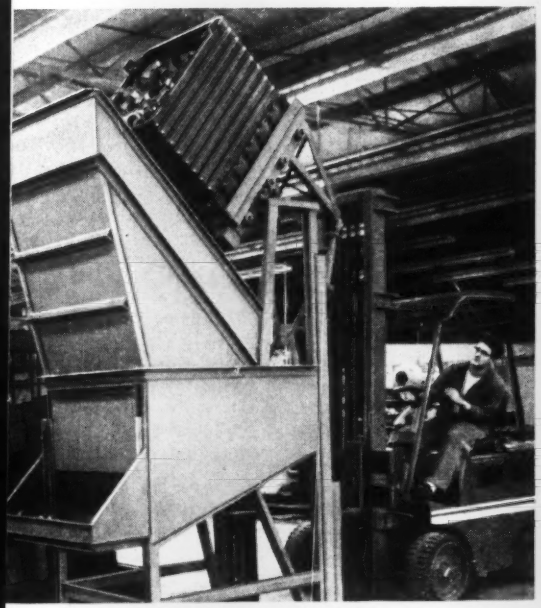
THESE REPUBLIC BOX AND SKID UNITS PERFORM FOUR JOBS, CUT HANDLING COSTS 10%. They were designed and fabricated by Republic's Pressed Steel Division for Dresser Industries' new pipe couplings and fittings plant at Wellsboro, Pennsylvania.

The multi-purpose units provide for: (1) Delivery of semi-finished parts to production stations for final machining. (2) Feeding of parts to machines in combination with hoppers built by Dresser's Ideco Division. (3) Receiving finished parts as they come off the machining line. (4) Storage of finished parts until ready for shipment.

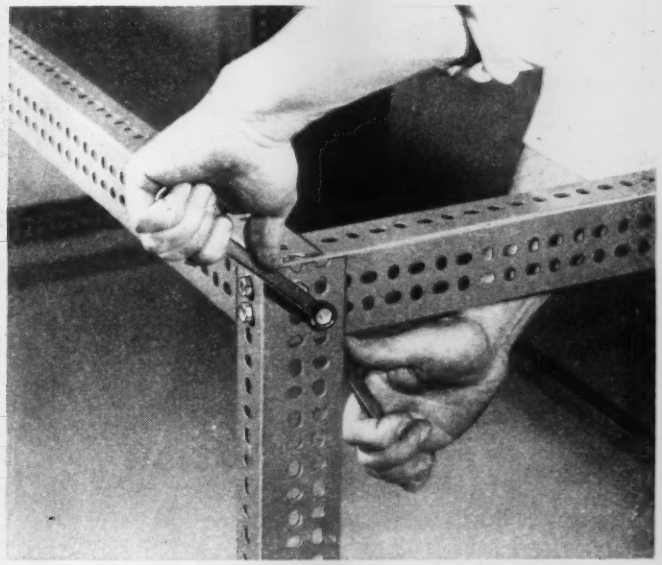
Plant management estimates a saving of 10% in handling costs since the Republic Box and Skid Units were placed in service. Also, it is possible to maintain an accurate inventory of both finished and semi-finished parts and to reduce storage space requirements.

Future savings in maintenance costs should be realized because corrugated-steel construction of the boxes and skids provides strength, assures long service life at lowest per-year-cost.

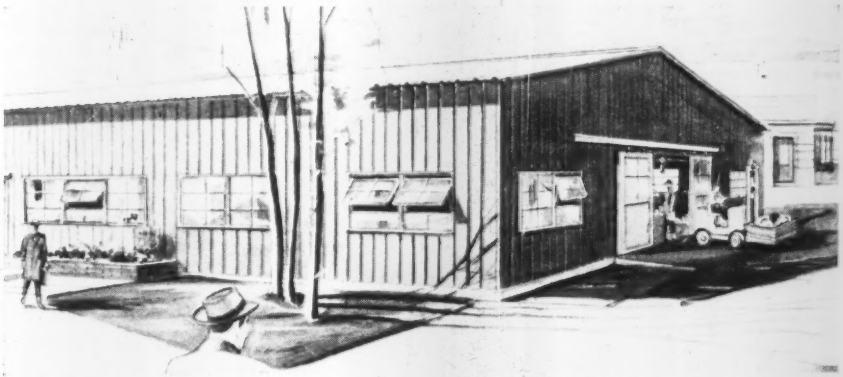
Now is the time to talk over your handling or storage problems with a Republic Engineer. A specially designed or a standard unit could cut your costs or simplify an operation. No obligation. Just contact your Republic Materials Handling Representative. Or mail the attached coupon.



CONTINUOUS MATERIAL FLOW to machines is a time and cost saving feature of Republic Box and Skid Units used in combination with Dresser-designed hoppers. Specially designed opening in front of box hooks and locks on hopper. Lift truck operator trips dumping mechanism with truck forks. Idle machine time is eliminated.



NEW SLOTTED CONSTRUCTION ANGLE MEETS ALL FRAMING NEEDS. That's Republic METAL LUMBER*, designed and engineered by Republic's Berger Division. It's versatile, durable, unlimited in application. Plan your assembly, cut Republic METAL LUMBER, join with bolts. Longitudinal and transverse slots on ¾-inch centers make adjustment easy. Bonderized and finished with baked enamel. Ten angles per bundle, light or heavy gage, 10- or 12-foot lengths, with hardware. Bundle stores in same space as one 2" x 4" piece of lumber. Send coupon for catalog loaded with ideas.



NEW "BUDGET BUILDINGS" by Republic's Truscon Division brings the cost of additional storage space down low. It's a quality steel building with a tight, dense, galvanized coating that's more rust-resisting than ever. Simplified design permits fast on-site erection. No painting needed. Your "Budget Building" order will be handled fast from off-the-shelf stocks. Immediate delivery in widths of 32, 36, 44, and 48 feet . . . 12- and 14-foot heights. Lengths as long as you want them. Send coupon for complete details.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

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☐ Have a Materials Handling Engineer call.

Send more information on:
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☐ Truscon "Budget Buildings"
☐ Republic METAL LUMBER

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Company_____

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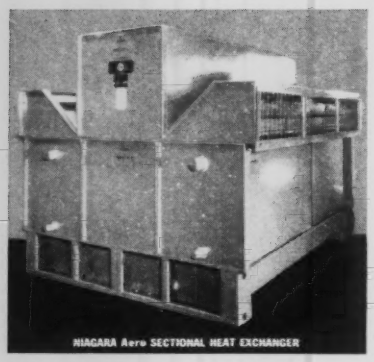
NIAGARA Aero SECTIONAL HEAT EXCHANGER

NIAGARA SECTIONAL *Aero* HEAT EXCHANGER

gives close temperature control, saves you

LABOR, Power, Water

● You gain in accurate control of quench bath temperatures and quickly effective capacity to handle initial peak load of heat in quenching. You prevent production set-backs, increase the output of your heat treating department, prevent oil fires, save losses from rejected parts.

Niagara *Aero* Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Use Niagara Aero Heat Exchangers also to cool and control temperature of furnace jackets, induction heaters, welders, wire drawing and extrusion dies, rolls, transformers, engines and all plant water cooling systems.

Write for Bulletins 120 and 132 giving complete information.

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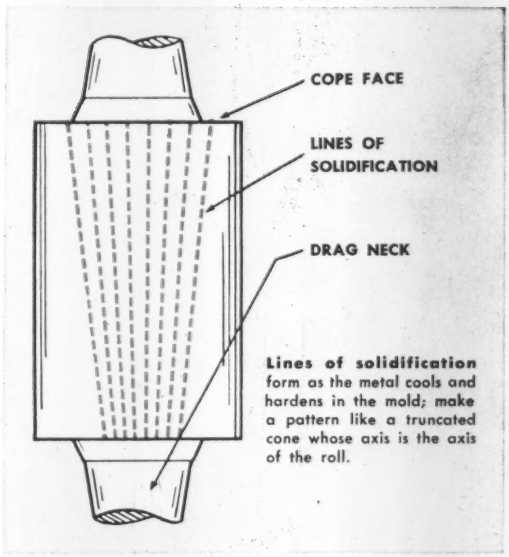
TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

What we learn from "fingerprinting" a back-up roll


COPE FACE
LINES OF SOLIDIFICATION
DRAG NECK
Lines of solidification form as the metal cools and hardens in the mold; make a pattern like a truncated cone whose axis is the axis of the roll.

"Cope face spot depth" sounds a little mysterious, but actually it is a relatively simple, accurate guide to the future performance of back-up rolls in 4-high mills. Even more important, when the roll maker keeps sulfur print records of the spot depth on every back-up roll he ships, it is possible to relate the pattern of the print to the actual tonnage turned out by the roll, as reported by the customer. With this information at hand, Mack-Hemp metallurgists can modify the alloy "mix" or the foundry practice so that the next set of back-up rolls will give even better service.

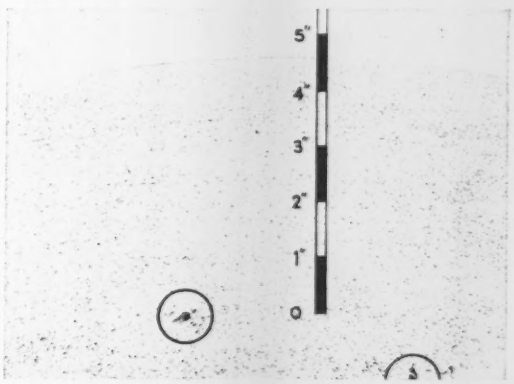
What "cope face spot depth" reveals—As a freshly-poured Mack-Hemp "Technalloy" or "Midland Superalloy" steel back-up roll cools and hardens, so-called "lines of solidification" form below the surface of the roll (see diagram). These lines arrange themselves in a cone-shaped pattern spreading outward as they ascend from the "drag" wabbler toward the upper shoulder of the roll body, or "cope face." The points where the lines of solidification end in the cope face can be detected by an acid etch, and a permanent record made by laying special photographic paper over the etched area.

As you can see, the depth of this zone of dense metal is shallowest at the cope face because of the way the lines angle outward. Hence, cope face spot depth provides a measure of the minimum amount of sound, homogeneous metal between these lines of solidification and the work surface of the roll.

Spots should be deep—In general, the roll maker's objective is to keep the spots on the cope face as deep as possible below the worn-out circumference of the roll. However, sheer depth is not the only indication of the roll's life expectancy and behavior in service. The arrangement and density of the spots also tell their story to the trained metallurgist, particularly when he studies them in the light of performance data from the customer and foundry practice at Mack-Hemp.

* * *

You can see why it's a good idea to keep careful records of tonnages rolled by your Mack-Hemp hot and cold mill back-up rolls. It's a good idea, too, to consult Mack-Hemp on any and all your problems of roll use and selection whenever they arise. Feel free to call or write us at any time.



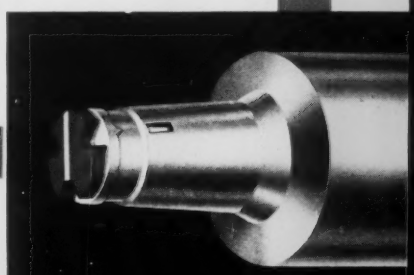
Sulfur print of "Superalloy" back-up roll. Two spots are clearly evident at the bottom of the print (⅓ actual size).

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery



timbre tester

Steels, like men, have different personalities. Years ago this mysterious something in steel was referred to as "body", "nature", or "character" . . . until 1930, when *Carpenter* researchers, borrowing a term from music, called it *timbre*.

Today, *timbre* is the common term steel men use when they refer to the still-mysterious but now-controllable property of tool steels, that determines grain size and toughness.

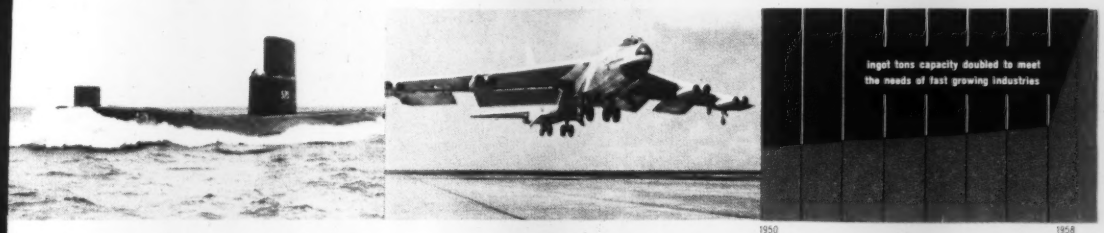
It was only natural that *Carpenter's* designation received immediate and general acceptance. For by that period in 1930, *Carpenter* was firmly established as a pioneer in the research and development of *fine quality steels*.

For many years, demands by American industry for *Carpenter*-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was *quality*, the pioneering of new and better steels, rather than *quantity*.

Within the past year, *we have doubled our ingot tonnage capacity*. Today, as the result of long-planned expansions, we can offer *quantity* along with famous *Carpenter quality*. For the first time, both are now available. And both will continue to be available . . . even in times of peak demand.

While *quality* will continue to remain a sacred *Carpenter* watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest steels.

Carpenter will continue to meet the *timbre test*.



tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter steel

The Carpenter Steel Company
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Modern Cooper-Bessemer Units

offer high efficiency, low operating cost

FOR OXYGEN PRODUCTION

If you are shaping up plans for new or improved oxygen production facilities, be sure to get acquainted with the distinct advantages offered by Cooper-Bessemer compressors and expansion engines.

For one thing, there are both reciprocating and centrifugal compressors in a wide range of types and sizes—exactly the right equipment without compromise. And, for unmatched efficiency in the air or gas expansion cycle, there are the outstanding Cooper-Bessemer expansion engines.

With extensive experience in supplying high volume compressors and expanders for today's most advanced oxygen production operations, Cooper-Bessemer can be of help to you in your planning. For detailed performance data, for engineering help to whatever extent you require, just get in touch with the nearest Cooper-Bessemer office.

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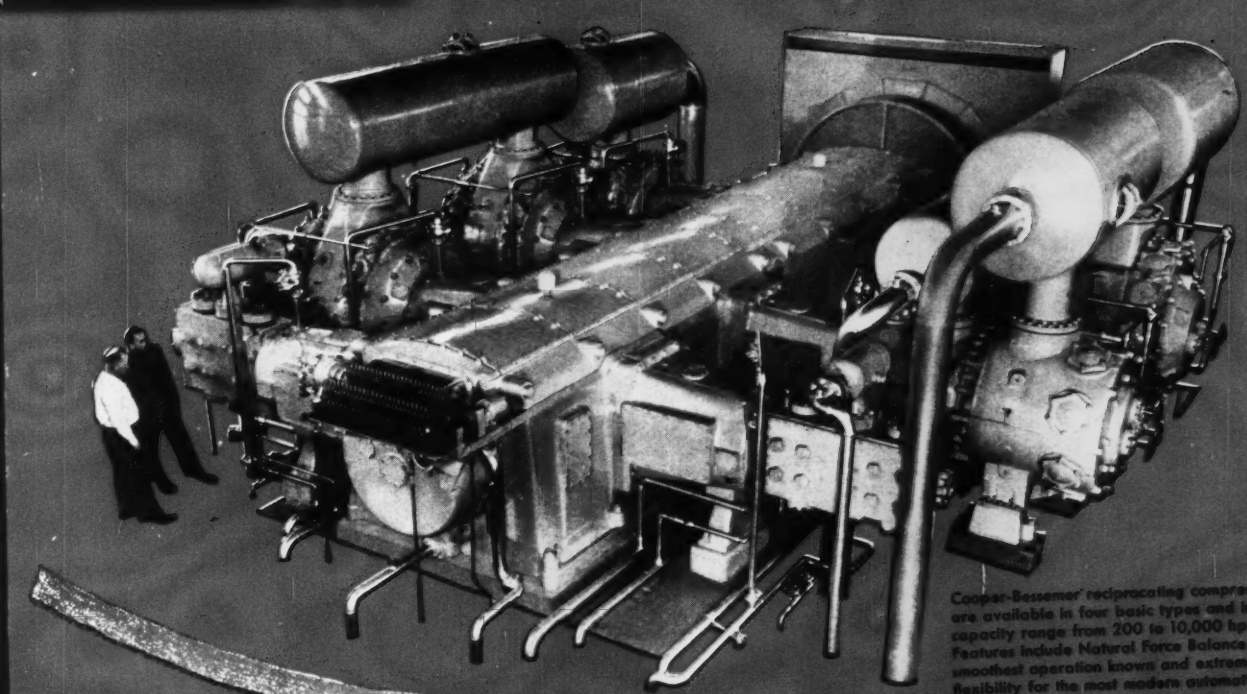
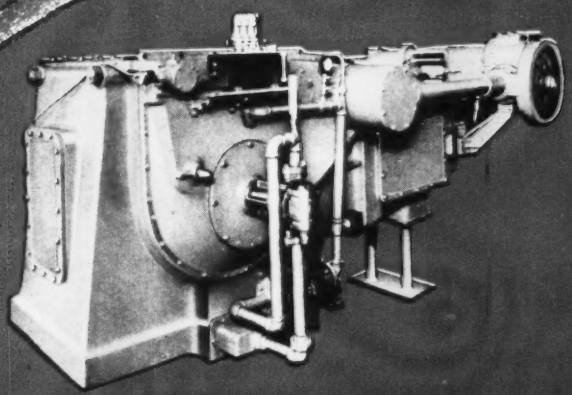
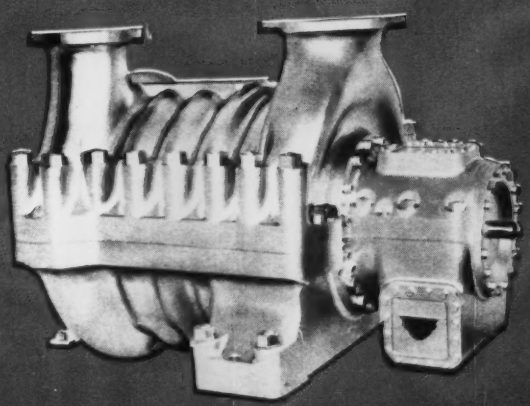
ENGINE OR MOTOR DRIVEN



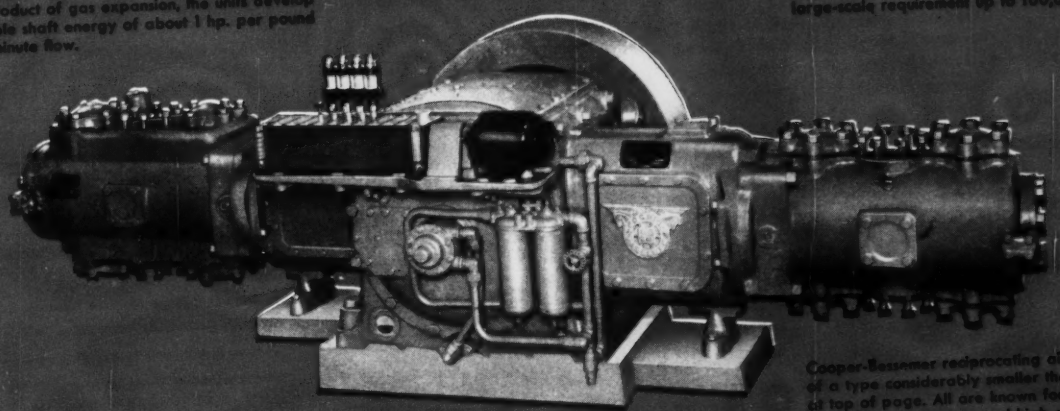
Cooper-Bessemer reciprocating compressors are available in four basic types and in a capacity range from 200 to 10,000 hp. Features include Natural Force Balance for smoothest operation known and extreme flexibility for the most modern automatic control techniques.



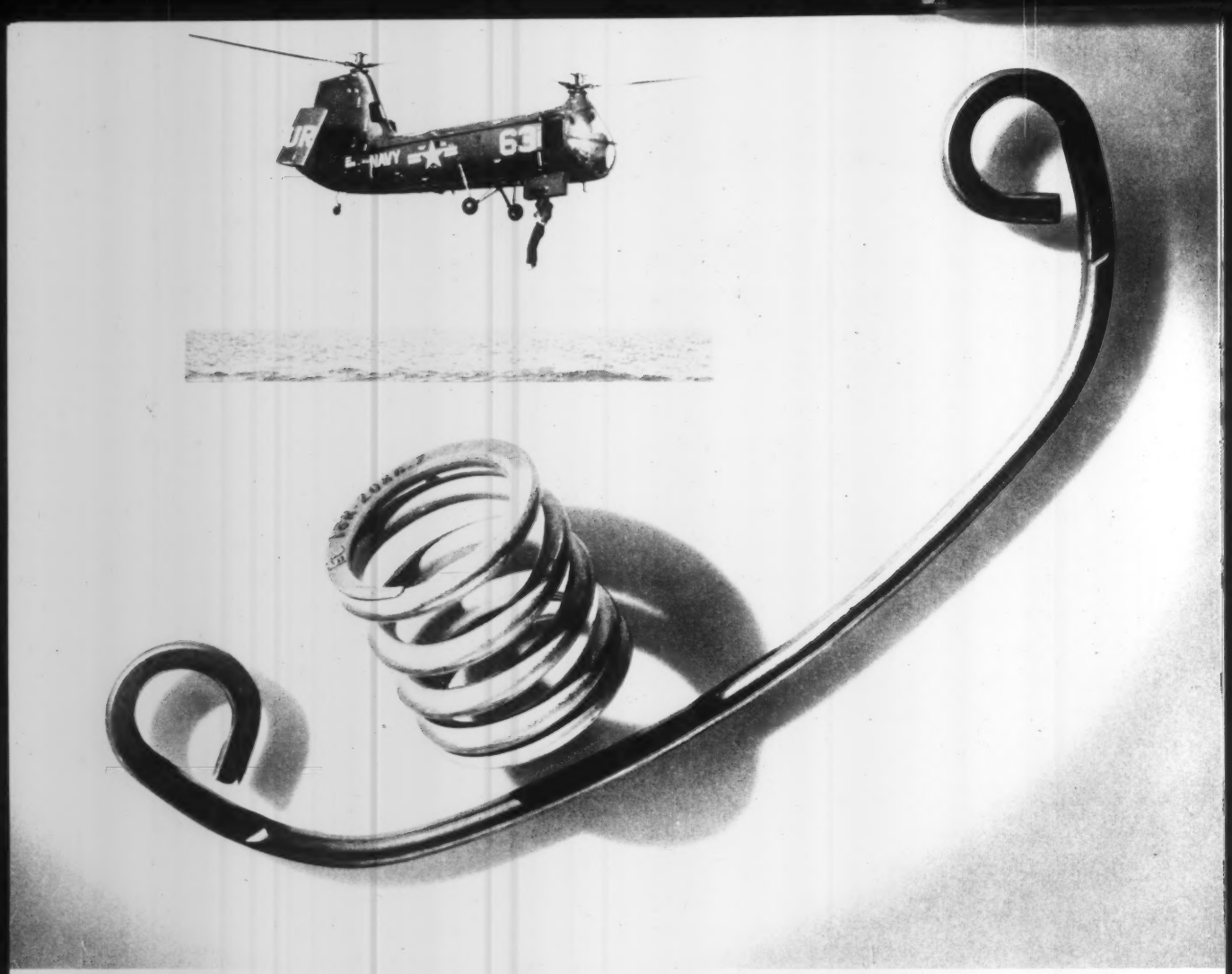
Cooper-Bessemer expansion engines are designed for inlet pressures up to 3000 psi and discharge temperatures to −300°F. As a by-product of gas expansion, the units develop useable shaft energy of about 1 hp. per pound per minute flow.



Cooper-Bessemer centrifugal compressors, like the reciprocating units, are offered in a wide range of types and sizes for virtually any large-scale requirement up to 100,000 cfm.



Cooper-Bessemer reciprocating air compressor of a type considerably smaller than that shown at top of page. All are known for smooth, trouble-free operation and high efficiencies.



Up with the Whirlybirds . . .

What helps this helicopter hover? It's an engineering principle — angle of tilt of rotor blades and speed of revolution. What's at the heart of the rotor assembly? Among other things, this rugged spring and tension bar made by an A.S.C. Division. The same exacting "aircraft quality" that produces these and hundreds of other high duty aircraft springs is available to manufacturers in any industry whose standards demand the best.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.

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CALENDAR
OF MEETINGS

Dec. 28-31, **American Marketing Association:** Winter meeting and exhibit, Morrison Hotel, Chicago. Association's address: 27 E. Monroe St., Chicago, Ill. Secretary: Schuyler F. Otteson.

1959

Jan. 11-14, **Institute of Scrap Iron & Steel Inc.:** Annual convention, Waldorf-Astoria, New York. Institute's address: 1729 H St. N.W., Washington 6, D. C. Executive vice president: Edwin C. Barringer.

Jan. 12-16, **Society of Automotive Engineers:** Annual meeting and engineering display, Sheraton-Cadillac and Statler-Hilton Hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 14-16, **American Management Association:** Research and development conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. R&D's division's manager: Philip Marvin.

Jan. 15, **Malleable Founders' Society:** Semi-annual meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Jan. 19-20, **Industrial Heating Equipment Association:** Annual meeting, Hotel Sheraton-Cleveland, Cleveland. Association's address: Associations Bldg., Washington 6, D. C. Secretary: Robert E. Fleming.

Jan. 19-21, **Southern Industrial Distributors Association:** Winter meeting, Biltmore Hotel, Palm Beach, Fla. Association's address: 1626 Fulton National Bank Bldg., Atlanta, Ga. Secretary-treasurer: E. L. Pugh.

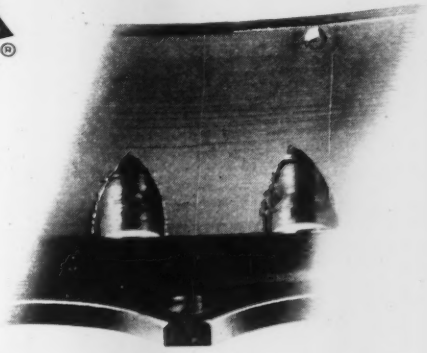
Jan. 20-21, **Steel Shipping Containers Institute Inc.:** Winter meeting, St. Regis Hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 21-23, **American Management Association:** Special packaging conference, Biltmore Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

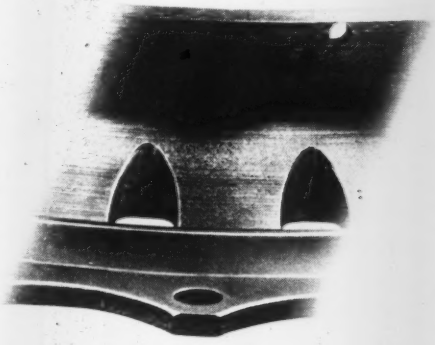
Jan. 21-25, **National Tool & Die Manufacturers Association:** Winter board meeting, Emerald Beach Hotel, Nassau, Bahamas. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Jan. 22, **Hoist Manufacturers Association:** Annual meeting, Palm Beach Biltmore Hotel, Palm Beach, Fla. Association's address: 1 Thomas Circle, Washington 5, D. C. Executive secretary: Joe H. Peritz.

OSBORN®



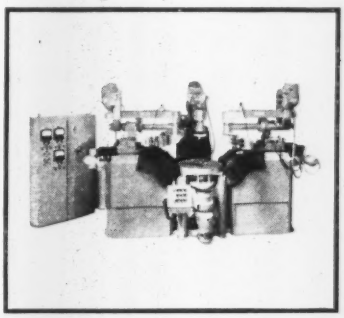
BEFORE BRUSHING
Jet engine part formerly hand-filed and emery-rubbed to remove burrs and sharp edges. *Hand-finishing time: 45 minutes.*



AFTER BRUSHING
Burrs thoroughly removed... edges and surface junctures blended to 6-8 microinches. Each part precision-finished quickly, uniformly. *Osborn Brushamatic® finishing time: 6 minutes.*

6 minutes to microfinish this jet engine part!

...it's 7½ times as fast with OSBORN Brushamatic® Methods



THESE JET ENGINE PARTS are microfinished at low cost, automatically—at high production rates on Osborn Brushamatic® 51-3L Machine. Three Osborn Fascut® brushes (with compound) operating at 1750 rpm do the job.

IT used to take 45 minutes to hand-finish this precision jet engine component. *Today, this leading jet engine manufacturer does the job in just 6 minutes with Osborn Brushamatic® Methods. It's 7½ times as fast and results in significant dollar savings.*

Slow hand-finishing still left scratch marks to cause possible stress fractures. But, rapid Brushamatic® finishing produces a *precision 6 to 8 microinch surface* . . . automatically removes burrs . . . blends sharp edges and surface junctures.

Result: a fast, economical, precision Brushamatic® finish that reduces stress concentration areas. Uniform, high-quality parts are produced at high production rates.

It's typical of how Osborn Power Brushing works to help you speed production . . . cut costs . . . improve product quality. An **O**sborn **B**rushing **A**nalysis, made in your plant at no obligation, will show you how. Write or wire us for details —and for your copy of the 20-page Brushamatic® booklet. *The Osborn Manufacturing Company, Dept. S-1, Cleveland 14, Ohio.*

Osborn Brushes

BRUSHING MACHINES • BRUSHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

THE STEEL SCAFFOLDING COMPANY, INC.
MANUFACTURERS OF Trouble Savers SINCE 1912

January 9, 1957

Mr. C. H. Lausberg
Area Development Department
West Penn Power Company
Cabin Hill
Greensburg, Pennsylvania

Dear Clem:

Needless to say, I am more than pleased that the final decision reached was on locating our new plant in Western Pennsylvania. In no small measure, a good deal of the credit rests with you and your associates and your untiring efforts. Your clear presentation of facts simplified our problem of sorting out the myriad of claims that so many communities set forth. It was gratifying to note that the Greater Uniontown Industrial Fund was well aware of the role you played and so acknowledged by the "plug" in the local paper announcements.

Many thanks for the Directory of Products and Manufacturers. It will be very helpful for future reference.

Sincerely,

N. A. Engelen, Secretary

SCAFFOLDING FOR EVERY PURPOSE

WEST PENN POWER

an operating unit of the
WEST PENN ELECTRIC SYSTEM

Hello . . .

I'm Charlie Fife . . .

This letter is very complimentary. But we won't accept all that credit.

Our part is quite simple. All we do is determine your requirements. Once we've done that, the only skill is to make sure that opportunities in our area apply to *you*. You see, we live here . . . know in detail the *favorable tax climate* that encourages industry. We know the localities that offer *100% financing* plans at low interest. We know where *labor* and *skills* are available.

We take credit for just this: We like to add two plus two and get four—no fractions. If you'd like us to work on your side of the equation, let us know. We've got a pretty good record of fours. Won't you let us prove it . . . in confidence, of course.

CHARLIE M. FIFE, *Manager*
Area Development Department

WESTern PENNsylvania

Area Development Department,
West Penn Power Company,
Cabin Hill, Greensburg, Pennsylvania

☐ Please have representative call

☐ Please send "Plant Location Services" booklet

S-5

Yes, I'm interested in WESTern PENNsylvania. ☐ Please send "Directory of Products & Manufacturers"

Name _____ Title _____

Company _____ Street _____

City _____ Zone _____ State _____

Up go wire coils out of the way...
Down go handling costs

We're anxious to do far more for our customers than simply take their order and ship the wire. Because we handle so much wire in our own plants, we have learned a lot of money-saving methods. And we're glad to pass them along to you.

For example, coils of wire unloaded in customers' plants are often simply piled on the floor, wasting floor space, cluttering aisles, creating inventory control problems and production headaches.

Bethlehem engineers helped one customer solve his wire storage problem as shown above. Built largely of steel pipe, these racks more than triple the storage capacity of the floor area. Coils are stored out of the way by lift truck—and quickly removed when ready for use.

We'll gladly help you with such things as pay-off reels and other equipment that will help you cut your wire-handling costs. We can be of special help in wire storage problems because we furnish steel racks of various types.

And remember, too, we make just about every kind of steel wire—both ordinary and special-purpose types. Just get in touch with the Bethlehem sales office nearest you, or write us direct.

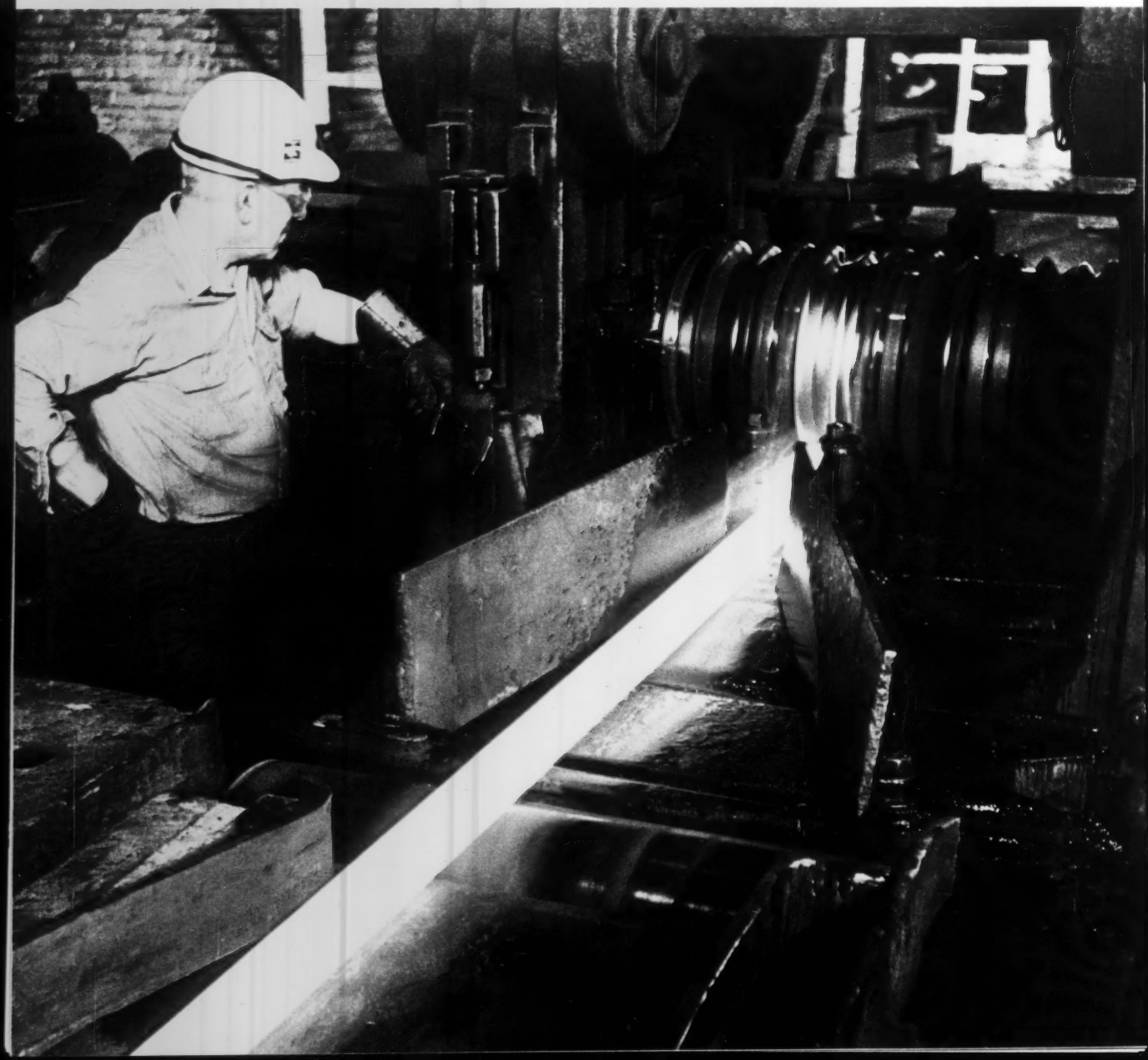
BETHLEHEM STEEL

Bethlehem engineers will help you with your steel-working problems

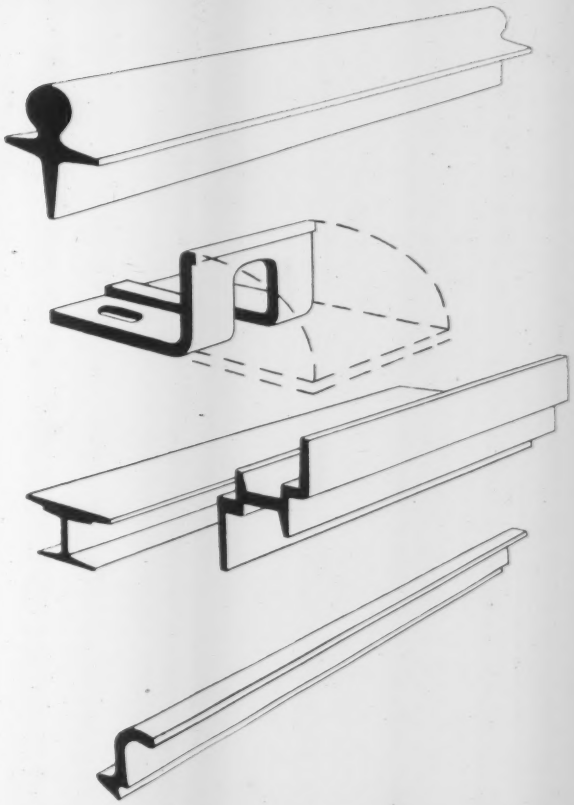
We hot-roll bars to your

We regularly supply a variety of manufacturers with "tailor-made" special steel sections, hot-rolled to precise dimensions. Rolling to size and shape puts strength where it's most needed. And it cuts machining and fabricating operations, reduces scrap loss, often permits better product design.

There's no end to the versatility of Bethlehem special sections. They're used in typewriters, pianos, lawn mowers; in railroad cars, electric motors, and automobile hinges. How about *your* products? Perhaps Bethlehem could help you make them better, faster, cheaper —with hot-rolled special sections. Phone our nearest sales office, or write us at Bethlehem, Pa.



special section



RAILROAD BRAKE BEAM SECTION
Compressing the "T" forces "round" outward to form strong, one-piece solid truss.

PRE-FORMED BLANKS FOR AUTO TRUNK LATCHES
Cold-formed by customer in a closed die.

COMPLEX DESIGNS FOR WINDOW-SASH SECTIONS
Hot-rolled to customers' specifications.

TRUCK TIRE SIDE RING MADE FROM SPECIAL SECTION BAR STOCK
Extra metal rolled into critical points.

In handling this 26-ft, 73-ton shaft, it was necessary to choose the slings with exceptional care. Strength, of course, was all-important. Two types of Bethlehem slings were used—8-part braided slings, and grommet slings with equalizing thimbles. As the photograph shows, the braided slings—with their wide, load-gripping surfaces—were passed around the shaft, then looped over crane hooks suspended from the grommets.

Your own lifts aren't likely to be of such large size. But whether you're handling many tons or just a few hundred pounds, you can lift with confidence when you use Bethlehem wire rope slings.

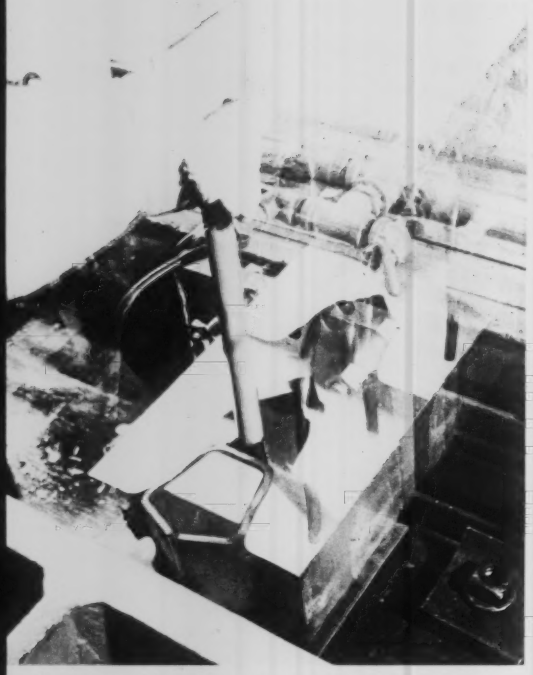
We make all types. Single-part, double-part, bridles, grommets, etc. Our engineers will design any type of sling for specialized needs, and furnish them quickly. Write for Catalog 368-A, *Bethlehem Slings and Fittings*.

BETHLEHEM STEEL

Safe and easy...
with Bethlehem wire rope slings

Forming 100,000 red-hot brackets...

a tough test for tool steel!



The camera catches the action as the die slams to form a red-hot bracket.

Here's a tough test for this hot-work grade of tool steel—forming 100,000 *red-hot* guard rail brackets, before die redressing is required.

The tool steel used in the bulldozer is Bethlehem's Cromo-W hot-work tool steel. This 5 pct chromium grade, with additions of tungsten and molybdenum, is one of our most popular tool steels for hot-work applications.

Each bracket is made from a piece of 4 in. x ¼ in. Bethlehem flat carbon steel, cold-punched and sheared to size. Heated red-hot, it is bent into a "U" shape. Then the bar is pressed into semi-final shape, and finally, the third set of Bethlehem Cromo-W dies "sets" the bracket by wrapping it around a mandrel, giving the finished bracket a backbone.

In addition to Cromo-W, Bethlehem manufactures a complete range of other hot-work tool steels for die-casting and extrusion work. In fact, Bethlehem makes top-grade tool steels for every job in the shop. See your nearest Bethlehem tool steel distributor for full details . . . and fast delivery of the right grade for your job. Remember, too, that Bethlehem engineers are always at your service.

Bethlehem Steels and Specialties

Here is a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:
Carbon and alloy AISI grades
Leaded carbon and alloy steels
Special rolled sections

TOOL STEELS FOR EVERY JOB (28 grades)

FORGINGS: Drop, press, hammer, and upsetter
Rolled-and-forged special sections

SHEETS: Hot- and cold-rolled
Continuously galvanized

TIN MILL PRODUCTS: Electrolytic and hot-dip tin plate; black plate

PLATES: Universal and sheared

ROD AND WIRE: General and special-purpose types
Fine and shaped wire

WIRE ROPE AND SLINGS

FASTENERS: Standard bolts, cap screws, rivets
Special fasteners

PIPE AND TUBES:
Continuous butt-weld
Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

PALLET RACKS

WELDMENTS: Frames, tanks, etc.

RAILS: Teè, crane, girder

CASTINGS: Carbon, alloy, and stainless steel
Grey iron; brass and bronze

PUBLICATIONS DEPARTMENT M3
BETHLEHEM STEEL CO., BETHLEHEM, PA.

Gentlemen: I would like additional information on

Name

Address

City and State

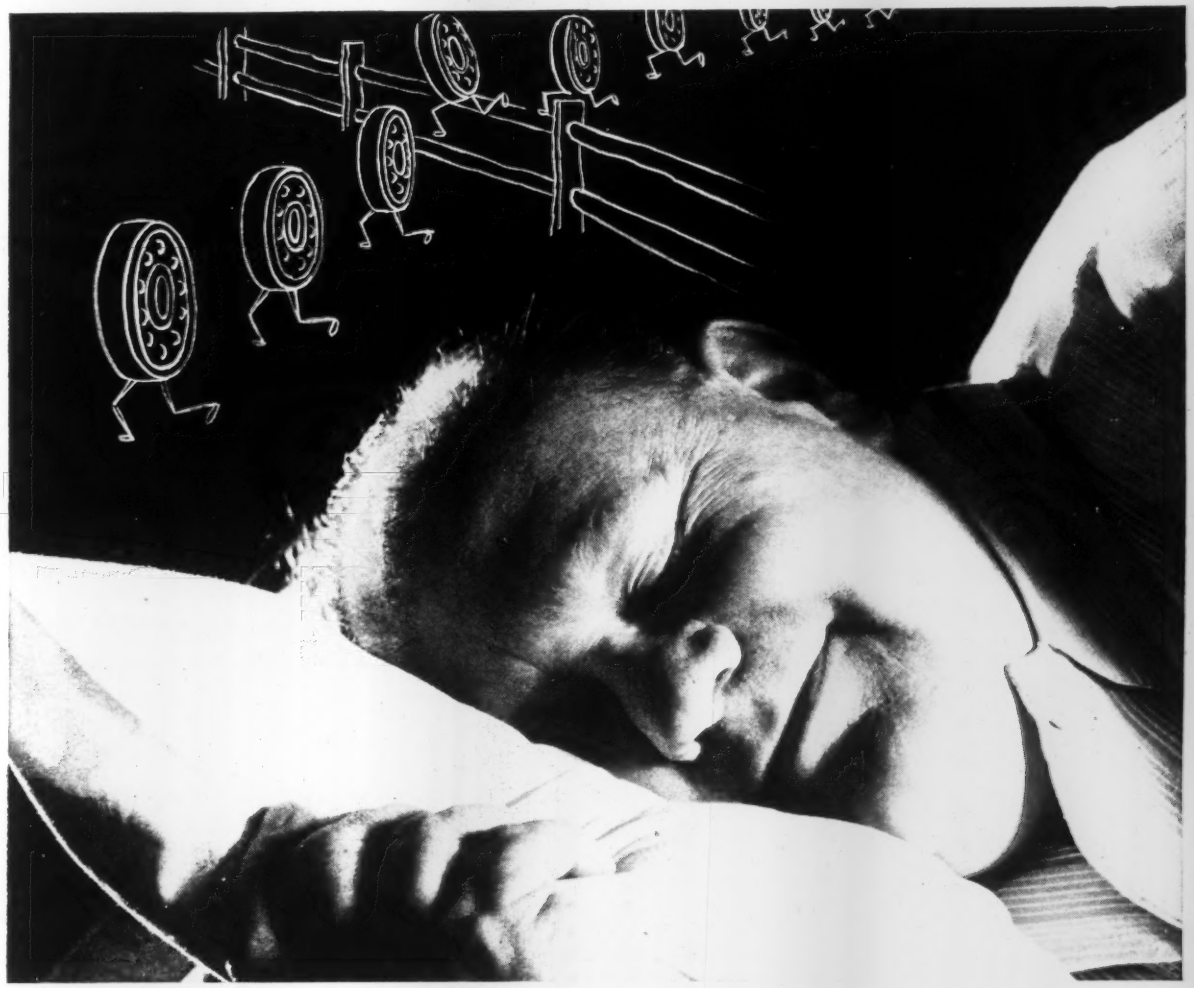
Folder 672 5812, Printed In U.S.A.

Bethlehem Steel Company, Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



SURE CURE FOR INSOMNIA–

count all 12,347 Federal Ball Bearing sizes

Happy dreams. But before you doze off, we'd like to make this point: Federal makes ball bearings in this tremendous range of sizes so that the right bearing is always available for all applications. And a list of the leading manufacturers who have taken advantage of this reads like a who's who of American Industry. By way of illustration, we might mention Universal Winding, Caterpillar, Ingersoll-Rand, Cutler-Hammer, IBM, and scores of others. The motors in your own shops, the appliances in your home may well owe their smooth performance to Federal Ball Bearings.

When Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, NEW YORK

Federal **Ball Bearings** *One of America's Largest Ball Bearing Manufacturers*

KEEPS CUTTING FLUIDS
AS FRESH AS A DAISY

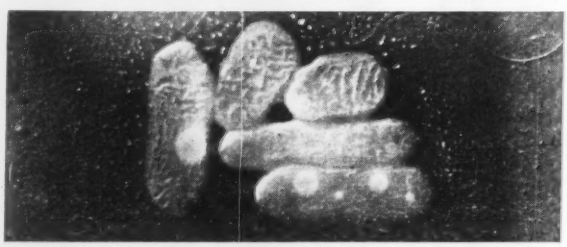
Here's why ELCIDE 75™ can increase the useful life of your soluble oil emulsions

Elcide 75 controls harmful bacteria that enter standard duty soluble oil emulsions and cause rancid odor, acidic corrosion, and emulsion breakdown. Prior to the development of Elcide 75, certain bacteria developed immunity to commonly used germicides, and no single inhibitor could control their damage.

Elcide 75 is a combination of proven anti-bacterial agents, and includes a powerful new compound related to one of the safest and most effective bacterial inhibitors used in the exacting field of medical surgery today. Just one ounce treats 4 gallons of emulsion.

Elcide 75 is not a "built-in additive" that is weakened by larger emulsion ratios. With Elcide 75 you know you have an effective, safe treatment because you add it to the emulsion right in your own plant.

Elcide 75 is completely safe for employees, machinery, and products. Not only is it non-toxic and harmless to sensitive skin, but its anti-bacterial action reduces the chance for infection caused by contaminated emulsions.



Bacteria cause emulsion trouble. This is a photomicrograph of *Pseudomonads*, one of the harmful types of bacteria found in oil-water emulsions. They enter the emulsion through the air, water, and plant debris, and make it possible for sulfate-reducing bacteria to cause odor, corrosion, and emulsion breakdown. Elcide 75 controls a much wider range of these and other types of damaging bacteria.

WHAT ELCIDE 75 MEANS TO THE METALWORKING INDUSTRY...

Operating costs can be greatly reduced because of Elcide 75. This saving is an accumulation of several important benefits.

Actual shop tests have shown that one ounce of Elcide 75 added to each four gallons of emulsion can keep the oil-water emulsion fresh as much as 5½ times longer. In one test, emulsions that normally had to be dumped at the end of four weeks ran for 22 weeks when treated with Elcide 75!

You can benefit by three direct savings—costly labor and down time for recharging will be reduced, your soluble oil requirements will drop, and the disposal cost of spoiled emulsions will diminish.

Elcide 75 also contributes to better products and longer machine tool life because it controls the bacteria which often cause acidic corrosion.

You can have a cleaner plant by using Elcide 75. It eliminates objectionable odors as well as bacteria that may cause skin infection. Elcide 75 is nontoxic and safe to use, as proved by tests conducted under normal shop conditions.

BACTERIAL PLATE COUNTS PROVE KILLING POWER OF ELCIDE 75

Emulsion treated with Elcide 75 | **Emulsion treated with commonly used germicide at recommended level** | **Emulsion treated with commonly used germicide at double the recommended level** | **Untreated emulsion**

The photographs shown above illustrate the broad, powerful anti-bacterial action of Elcide 75. The light areas are bacterial colonies that have grown in three of the emulsion samples during 8 weeks' use. Note that none of these harmful bacteria appear in the emulsion treated with Elcide 75 during the same 8-week period. The emulsion stayed fresh.

PUT ELCIDE 75 TO WORK FOR YOU

The best way to determine the value of Elcide 75 to your own operation is to try it under normal plant conditions, using your standard duty emulsion. After you compare the costs of operation, you will agree that Elcide 75 is a valuable discovery that deserves a permanent place in your plant. Why not try Elcide 75 soon?

ELCIDE 75™

PATENT PENDING

Lilly

PRODUCT SPECIFICATIONS
ELCIDE 75

(Lilly's brand of bacterial inhibitor for cutting fluids)

Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium *o*-phenylphenate.

Package	Price per Gal.
1-gallon polyethylene	$8.50
5-gallon polyethylene	$8.00
55-gallon stainless steel	$6.50

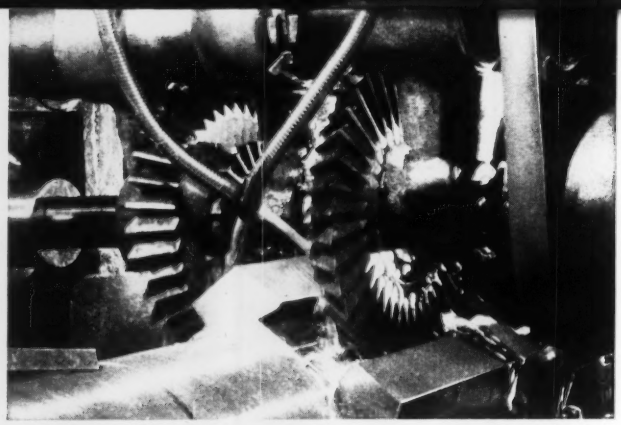
This product is sold only through selected distributors.

For further information or to place your order, write or phone:

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA

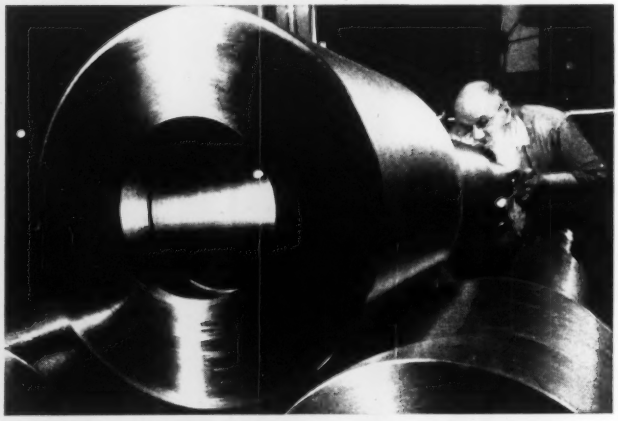
TELEPHONE: MElrose 6-2211

SAVES $150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged $180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately $150 per gear.



MILLING TIME DOWN 71%—Hi-Qua-Led Steel open-die forgings enabled a machine tool builder to reduce time for straddle-mill dovetailing of pentagon shape by 71%. Overall time for piece, including milling, turning and trepanning, is cut 33%, and a significant saving in tools is also noted.

IMPROVED FINISH—A manufacturer reports a much smoother gear finish with ALCO Hi-Qua-Led Steel. There is a complete lack of burrs which formerly required extensive hand filing to remove. In addition, time for this cutting operation on a Fellows gear shaper is reduced 47%, and tool wear is down 20%.

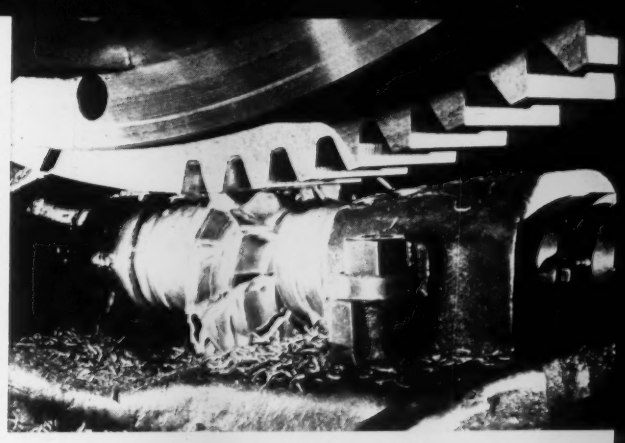


700% INCREASE IN TOOL LIFE—In trepanning a 4 in. diameter hole 42½ in. long with a Warner & Swasey lathe, tool life averaged one piece per tool. With Hi-Qua-Led, 8 pieces are now obtained with the same tool. Manufacturer reports that Hi-Qua-Led Steel also provides much better chip formation.

EASY-MACHINING HI-QUA-LED STEEL* FORGINGS GIVE INDUSTRY NEW OPPORTUNITY FOR PROFIT

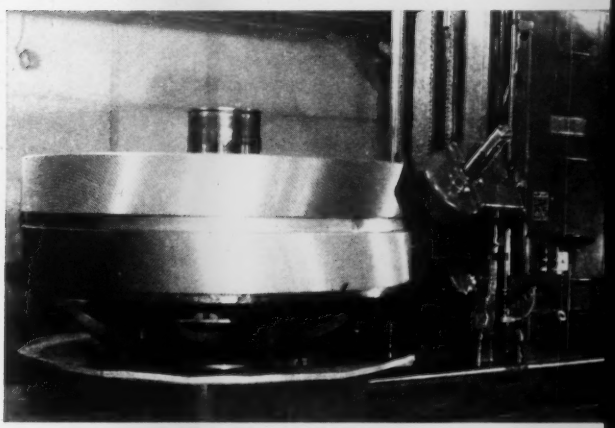
* **HI-QUA-LED STEEL**—ALCO's registered trademark for its new process leaded-steel forgings that are making outstanding reductions in tool wear, machining time and production costs.

TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-leaded steel.



8-HOUR JOB DONE IN 3—Another manufacturer reports that roughing and finishing a gear required a total of 8 hours and 8 minutes on his gear cutter. With freer-machining Hi-Qua-Led Steel and the increased speeds and feeds it permits, the job is now completed in just 3 hours and 10 minutes.

FASTER SPEEDS, NORMAL TOOL WEAR—A gear manufacturer using a Fellows gear cutter was able to increase rough-cut speed 37% and finish-cut speed 111% with Hi-Qua-Led Steel. Smoother operation is noted, and the tremendous reduction in machine time is accomplished with only normal wear to cutter.



SAVES FULL WORK WEEK—Using gear blanks of ordinary steel, roughing and finishing on a Gould and Eberhardt machine previously required 65.1 hours. The improved machining qualities of Hi-Qua-Led Steel have speeded up gear production and the job is now completed in 24.9 hours, saving a 40-hour work week.

The easy machinability of ALCO's Hi-Qua-Led Steel® forgings is setting new production records and boosting profit throughout industry. While maintaining all the physical characteristics of regular steel in any AISI grade, forgings of Hi-Qua-Led Steel, ALCO's special process leaded steel, provide the extra benefits of greatly reduced machine time, longer tool life and improved surface finish. In addition, the reduced friction component of Hi-Qua-Led Steel forgings assures much closer tolerances.

By switching to ALCO's Hi-Qua-Led Steel forgings in your operation, you can cut your machining costs drastically. Along with this reduction in costs, Hi-Qua-Led Steel forgings will provide the same service in your end product as you obtain with regular forgings.

ALCO specialists are available to show you—on your own machines, in your own plant—how Hi-Qua-Led Steel forgings will boost your profit. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide. Contact the ALCO sales office nearest you for complete details. For a booklet containing technical information on Hi-Qua-Led Steel forgings, write ALCO Products, Inc., Dept. 153, Schenectady 5, New York.

ALCO

ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES · DIESEL ENGINES · NUCLEAR REACTORS · SPRINGS · STEEL PIPE · FORGINGS · OIL-FIELD EQUIPMENT

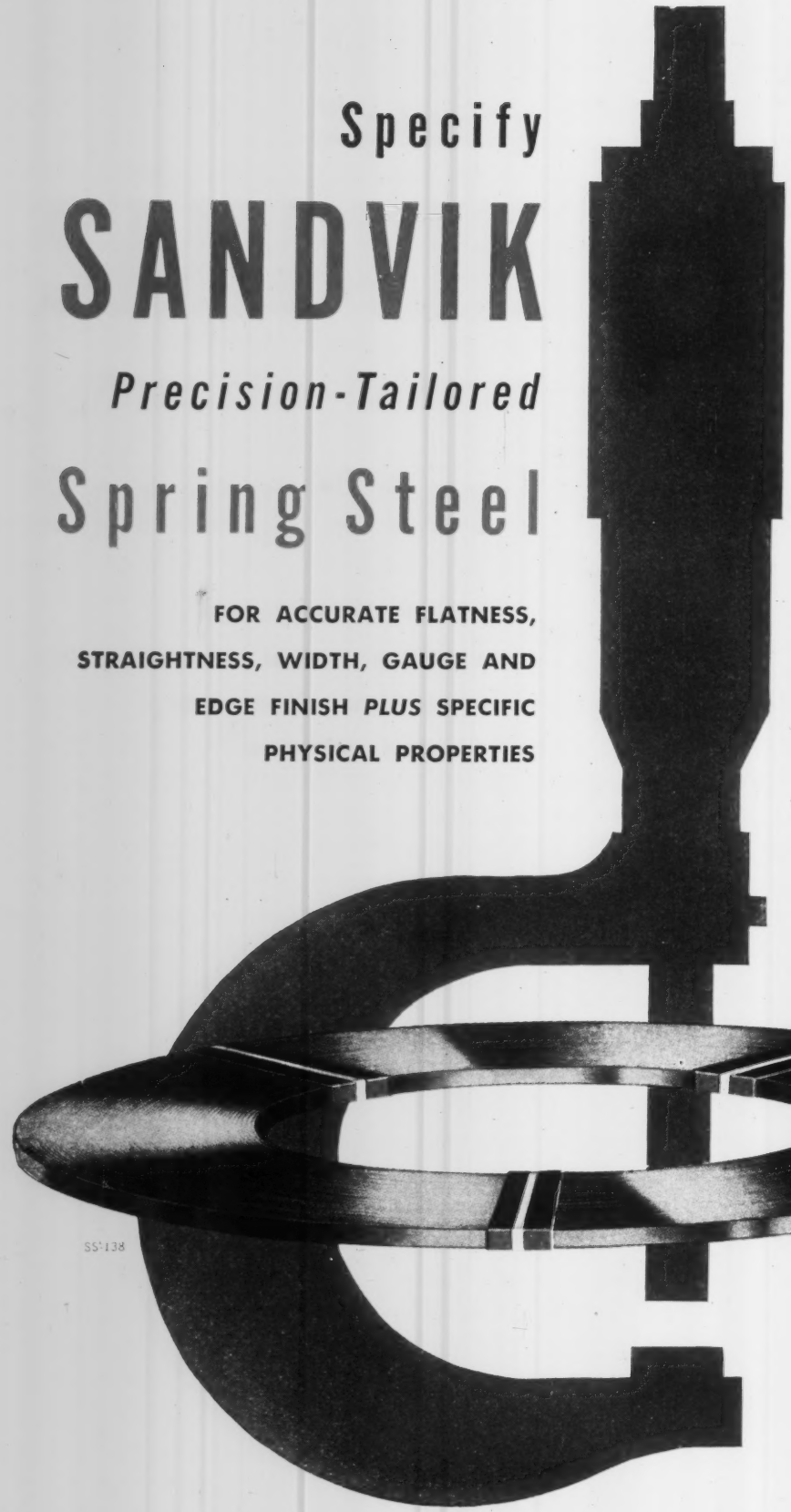
Specify

SANDVIK

Precision-Tailored

Spring Steel

FOR ACCURATE FLATNESS, STRAIGHTNESS, WIDTH, GAUGE AND EDGE FINISH *PLUS* SPECIFIC PHYSICAL PROPERTIES



SS-138

When you require specific physical properties combined with accurate dimensions in spring steel, call Sandvik.

From composition, through processing to the finished strip, Sandvik has had long experience in precision-control. That is why you find Sandvik steels used for feeler gauges, watch springs, compressor valves, camera shutters, reeds, shock absorbers and many other exacting spring steel applications.

Sandvik supplies cold rolled specialty strip steels –

- **In special analyses for specific applications.**
- **Precision-rolled thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered — scaleless or polished bright, yellow or blue.**
- **With square, round or dressed edges.**

Sandvik stocks a wide variety of qualities and sizes. In addition Sandvik has Rolling, Slitting, Edge-Filing and Hardening and Tempering facilities.

NEW, FREE BROCHURE

Gives Specific Data On Sandvik Cold Rolled and Hardened and Tempered Strip Steels. Catalogs leading types by application and lists finish, usual size range and chemistry. Send for your copy today.

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Tel. SWarthmore 7-6200
In N. Y. C. Algonquin 5-2200
Warehouses: Fair Lawn, N. J. • Cleveland • Los Angeles
Branch Offices: Cleveland • Detroit • Chicago • Los Angeles
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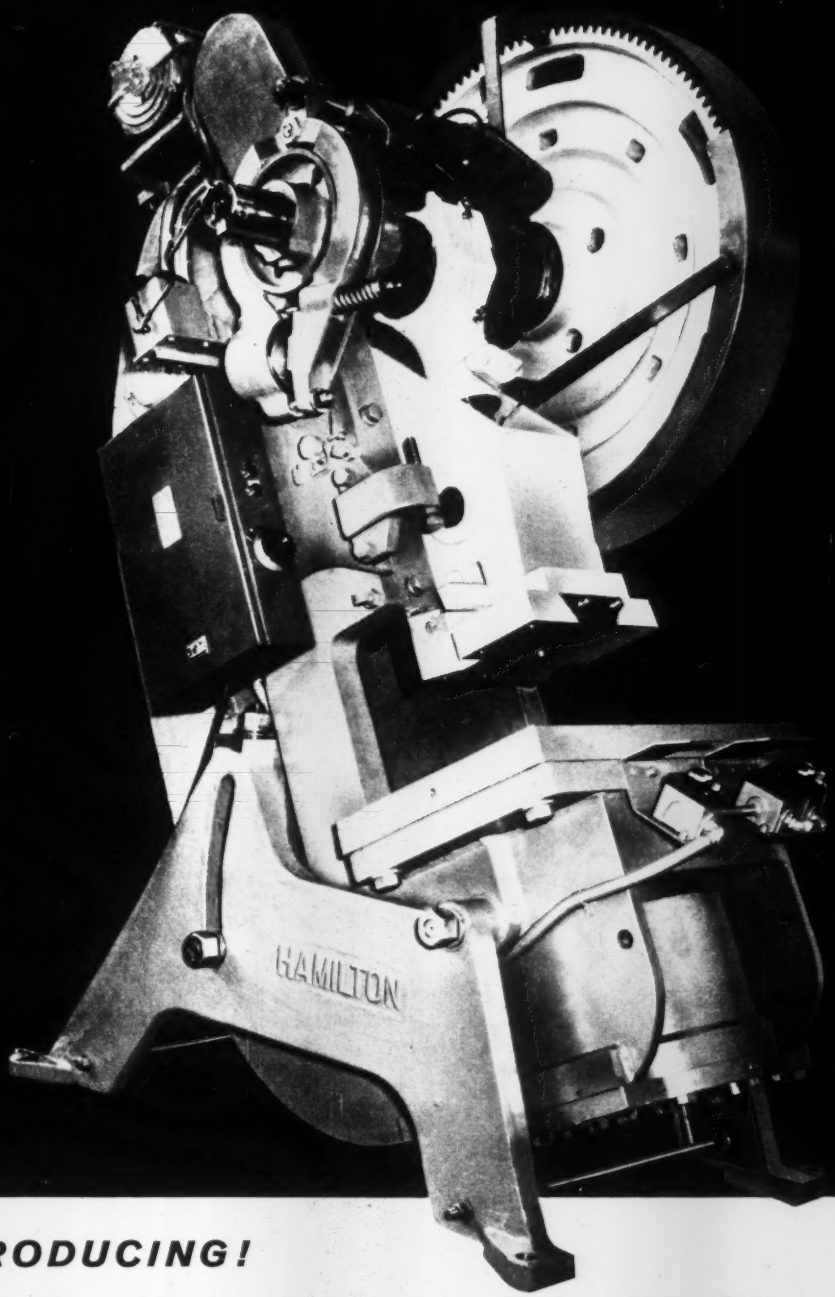
WORKS: Sandviken, Sweden

Sandvik Quality Steels



INTRODUCING!

New Hamilton open-back inclinable presses

Special features of Hamilton OBI Presses include stress-relieved welded steel design — lowers deflection so that up to 50% more stampings can be produced before dies require regrinding; disc-type air clutch, mounted on the crankshaft, to permit low-inertia starting with reduced heat generation; special air-released, spring-actuated brake for maximum efficiency and production speed with low heat loss; extreme stability and wearing qualities made possible by a wrist pin and crosshead type connection.

Write to Dept. 1-M for Bulletin 13302

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

BALDWIN BLH LIMA-HAMILTON

He proved that 1 wheel could outperform 3 at Steelcraft Tool Co.

Steelcraft Tool Co., of Detroit, used to use three different grinding wheels to grind angles on straight high speed steel form tools. Then Bay State distributor Jim Frederick, of Detroit's Industrial Abrasives Co., showed them how a single Bay State specification would cut *fast* for roughing and *fine* for finishing.

Result: Costly wheel changes were cut way down and both Roland Belardnelli, co-owner of Steelcraft, and John Kulpa, chief operator, rate the new wheel A-plus for speed and precision, too.

Your Bay State distributor may come up with more than one cost-saving idea for you. *Better grinding at lower cost—that is his business.*

Steelcraft operator John Kulpa checks performance of new Bay State wheel on high speed steel form tool job. (Guard removed for photography).

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

Charging-Box Cars . . .

built to last by a company that uses them!

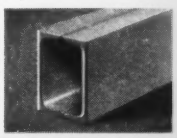
5 unique structural features make them better

Charging-box cars have to take a lot of punishment. And, in the 36 years we have been making charging-box cars for our own use, United States Steel has developed several features in structural design that assure longer life, less maintenance, and dependable service.

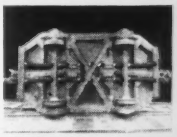
As illustrated in the typical four-box car shown here, the advantages of these design features—plus the rugged durability of all-welded *rolled* steel construction—make any size USS Charging-Box Car a profitable investment.

Our representatives will be pleased to call at your convenience to discuss your requirements for this or any other type of industrial car. Meanwhile, write for our free illustrated booklet—*USS Custom Designed Cars*. United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

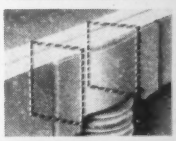


Box girder construction: Two channel sections, welded toe-to-toe, provide a frame far stronger than the ordinary angle or channel frame. This box frame is used under both the sides and ends of the car.



Double center sills: *Two* channels, back to back, run the entire length of the car. All cross members are welded to these sills, providing superior longitudinal rigidity.

X-frame bracing: These cross braces tie the box girder frame and the center sills together for additional strength and rigidity.



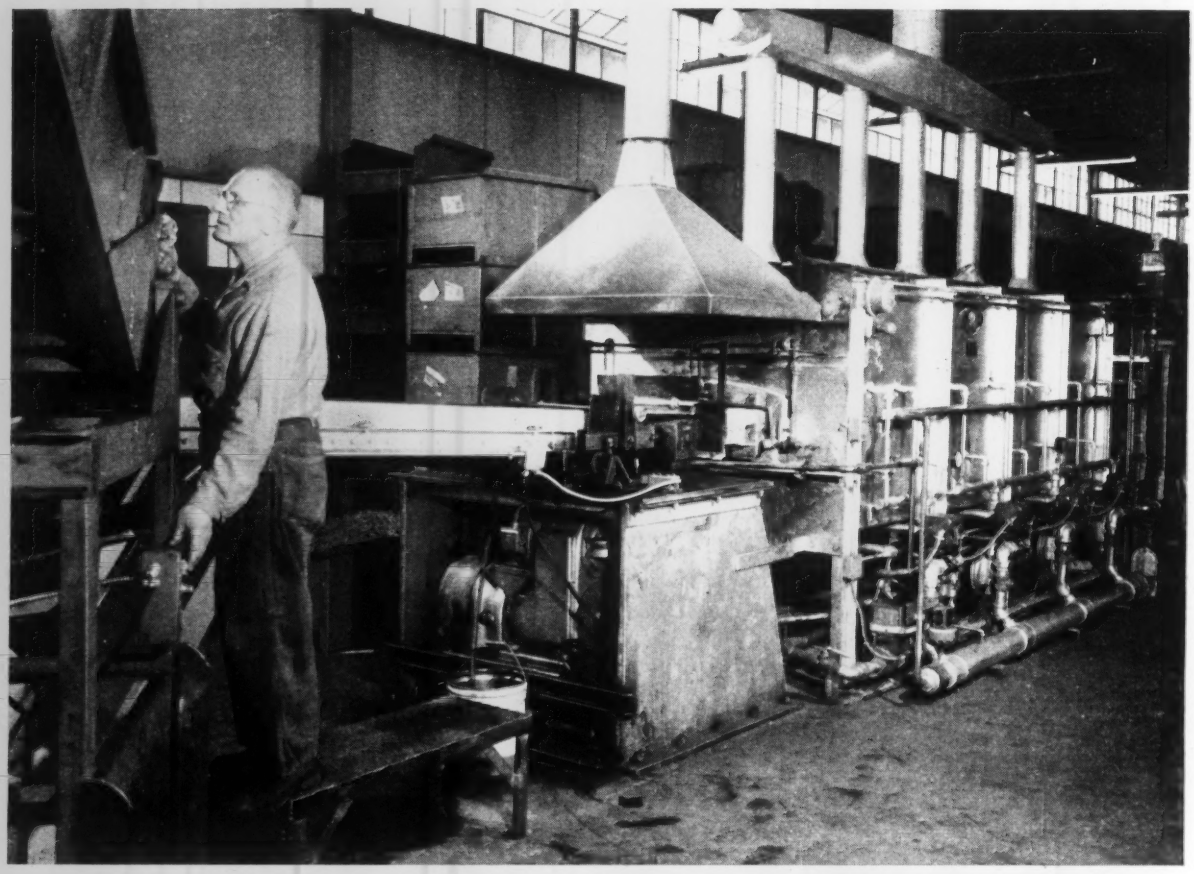
Spring pockets: Over each wheel, pockets are built into the bottom of the frame and "boxed in" on all sides. Coil springs are set into these pockets. This construction permits vertical, but no lateral, movement of the springs.

Long-shanked couplers: Pivot points of couplers are *behind* each axle. This permits turning the car on a short radius curve with less wheel flange pressure than with a short-shanked coupler.

USS

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

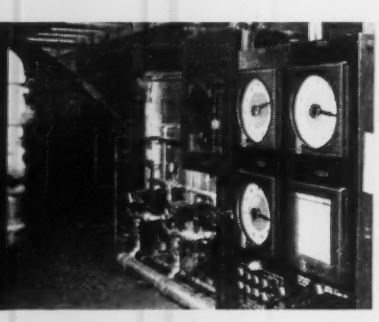
United States Steel



Lamson & Sessions Co.: Operator checks loading of furnace used to harden bolts made of 1038, 1335 and 4140 steel.

Reproducibility of hardening temperatures a problem?

Not at Lamson & Sessions Co.'s Chicago plant, where Speedomax® H controllers are helping to assure reproducibility of hardening specs for nuts and bolts. With competition keen, dependability and reproducibility of processing equipment is a "must". Since installation nearly two years ago, Speedomax H has been controlling temperature of hardening and draw furnaces 5 days/wk, 24 hrs day. Weekends, furnaces idle at control temperature. Maintenance has been negligible . . . temperature always within specs. Rugged, compact and completely reliable, Speedomax H is providing the same dependable control on numerous heat treat operations . . . is helping produce both process economies and a quality product. *Whatever your heat treating process, it'll pay you to investigate Speedomax H!* For details, contact your nearest L&N office or write 4957 Stenton Ave., Phila. 44, Pa.



Four Speedomax controllers occupy little panel space . . . hold temperatures of 4-zone hardening furnace well within specs. A fifth Speedomax controller regulates draw temperatures.

LEEDS Instruments **NORTHRUP** Automatic Controls • Furnaces

brighten homes, brighten sales with life-long beauty

UNILOY
STAINLESS STEELS

The gleaming beauty, plus the permanence and ease of cleaning have made stainless steel the wife's delight—and sold many a home.

When made from Uniloy stainless steel, flatware, utensils, and other kitchen accessories have that inviting blend of beauty and permanence so appealing to the modern homemaker.

Uniloy stainless steels—easy to work and form—are rolled to most exacting specifications by steel makers who have been making specialty steels since 1884.

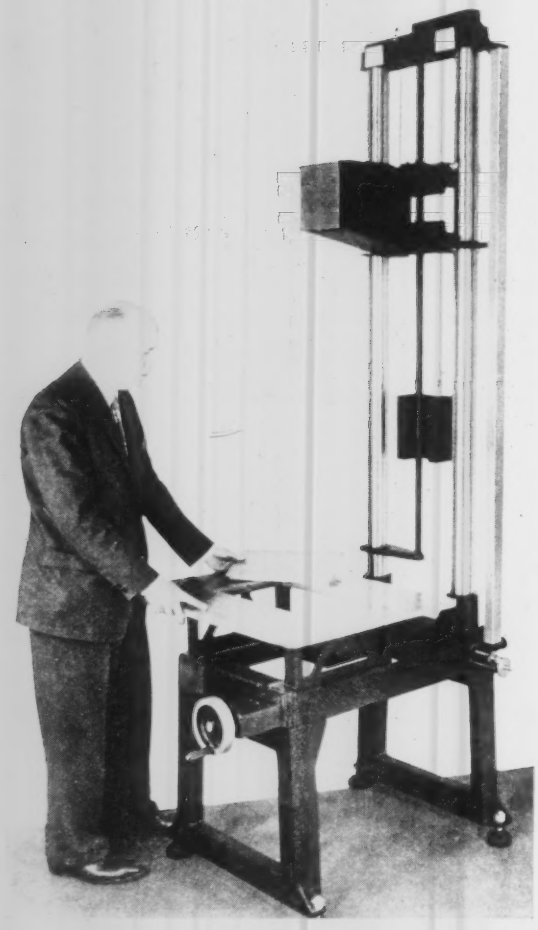
UNIVERSAL CYCLOPS
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

sales "ZOOM"

when your product offers new precision and efficiency...

with the Saginaw Screw



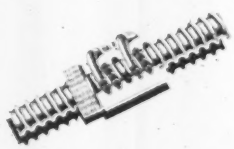
The Warren C. Portman Company uses the Saginaw b/b Screw to smoothly and accurately raise and lower the camera carriage on its new titling, animation and special effects camera stand.

"WE'VE FOUND THAT THE SAGINAW SCREW IS A DEFINITE SALES FEATURE in our new special effects camera stand, where precision control and smooth operation is essential to 'Zooms' and other special motion picture effects," *says Mr. Warren C. Portman, Warren Conrad Portman Company, photographic equipment manufacturers.*

A more profitable sales picture can zoom into focus fast . . . when you do as the Portman Company has done: switch from a high-friction acme screw to the virtually frictionless Saginaw b/b Screw for greater Sales Appeal!

The truly amazing ability of the Saginaw Screw to convert rotary motion to linear motion with over *90% efficiency* is saving power, space, weight and assuring smoother, more dependable performance in countless products from miniature electronic controls to giant production equipment.

Perhaps the Saginaw Screw can give *your* products that vital new Sales Appeal you're looking for right now. To find out, write or telephone Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan —*world's largest producers of b/b screws and splines.*



Give your products NEW SALES APPEAL... switch to the Saginaw ball bearing Screw

WORLD'S MOST EFFICIENT ACTUATION DEVICE

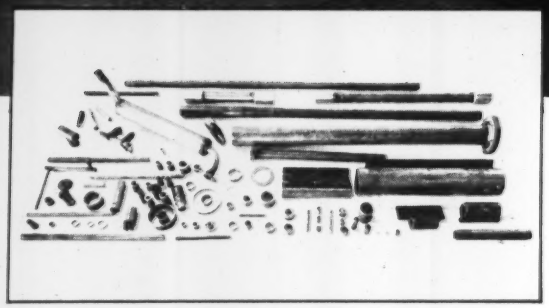
Youngstown
Yoloy Steel

will help
build the trucks
of his day

Roaring along special truckways—carrying tremendous payloads—the huge cargo carriers of *his* day will require far more Yoloy steel than was needed to build trucks in Dad's time. Youngstown, today, is anticipating tomorrow's need for more and better Yoloy. Continuing advancements in research and steelmaking facilities make certain that when cargo carriers are built in *his* day . . . *Youngstown Yoloy steel will help build them.*

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel



Seven-million miles of street and industrial sweeping in 700 cities have proved rugged dependability of Wayne Manufacturing Company's equipment. Here is the final assembly line in its plant. Large horizontal tube on sweeper is jack shaft housing for gutter broom drive. Wayne makes 300 parts from Pittsburgh Steel's Seamless cold-drawn tubing (see inset at right). That's how . . .

Pittsburgh Steel Seamless Tubes Help Wayne Make Clean Sweep

Nobody knows how many brooms it would take to keep the world clean. But out in Pomona, California, Wayne Manufacturing Company is ready to tackle the job with a complete line of power sweepers.

Founded only ten years ago, the Wayne Company has grown rapidly until today it produces more street and industrial power sweepers than all others in the field combined. Wayne is the only power sweeper produced by assembly-line operation.

Largest Wayne sweepers handle up to four cubic yards of debris at a time. Their assembly requires more than 1,000 complicated and accurately manufactured steel parts.

• **300 Key Parts**—Of these, more than 300 key items are fabricated from Pittsburgh Steel Company's Seamless Tubing in both carbon and alloy grades in sizes ranging from one-quarter inch to six inches in diameter It is furnished cut to length and ready for fabrication by Baker Steel & Tube Company of Los Angeles, a Pittsburgh Steel distributor.

This service helps speed Wayne production, keeps inventories down and is typical of service rendered by all Pittsburgh distributors.

"Requirements for the parts produced from Pittsburgh tubing are exacting," says Wayne production vice-president, Roy E. Nelson. "Our sweepers are doing big jobs, many of them operating on a 24-hour schedule, and we

must have a tough, dependable product in the critical spots to take this constant heavy beating."

That is why Wayne uses Pittsburgh Seamless Tubing in critical components such as rugged axle assemblies, torque housings, drive shafts, hydraulic actuating cylinders—even small fittings.

Over the years, Wayne production men have found Pittsburgh tubing has the surface finish, close size tolerance and concentricity which minimize the amount of machining that must be done. Its uniformly high physical properties and internal soundness provide the stamina necessary for long, trouble-free service.

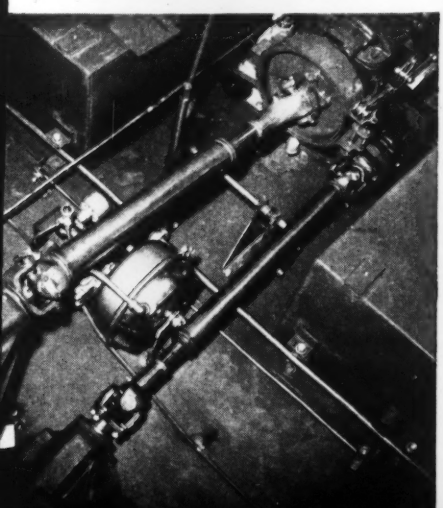
• **Ease of Fabrication**—The machinability and weldability of Pittsburgh tubing make for ease of fabrication, keep scrap losses down, and assure uniform parts—all important factors in keeping production lines moving smoothly.

As an aid to industrial good housekeeping, Wayne produces smaller power sweepers for use inside and outside plants. Its newest line is the Autoette series which includes the glamorous "Golfmobile" and the family "Cruise About." Three industrial models provide efficient transport of personnel and materials in sprawling plants.

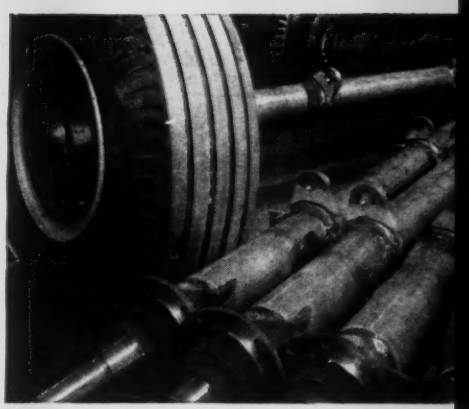
These industrial sweepers and Autoettes also depend upon Pittsburgh Steel tubing for parts in key assemblies.

Manufacturers find the uniformly high quality of Pittsburgh cold-drawn steel seamless tubing and excellent service from Pittsburgh distributors are big assets in improving products and operating efficiency. To enjoy these benefits get in touch with the representative nearest you.

Pittsburgh tubes withstand torque and fatigue in main and auxiliary drives on Wayne sweepers.



Machinability and weldability of Pittsburgh tubes are vital in making this shaft which goes into differential assembly. Short tube is welded over longer, smaller diameter tube, then machined to tolerance of .001 inch to assure perfect fit in housing.



Rugged front axle assembly of Wayne sweeper made from Pittsburgh tubes carries most of weight of machine and up to four cubic yards of debris. It must withstand road shocks and constant heavy-duty operation.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

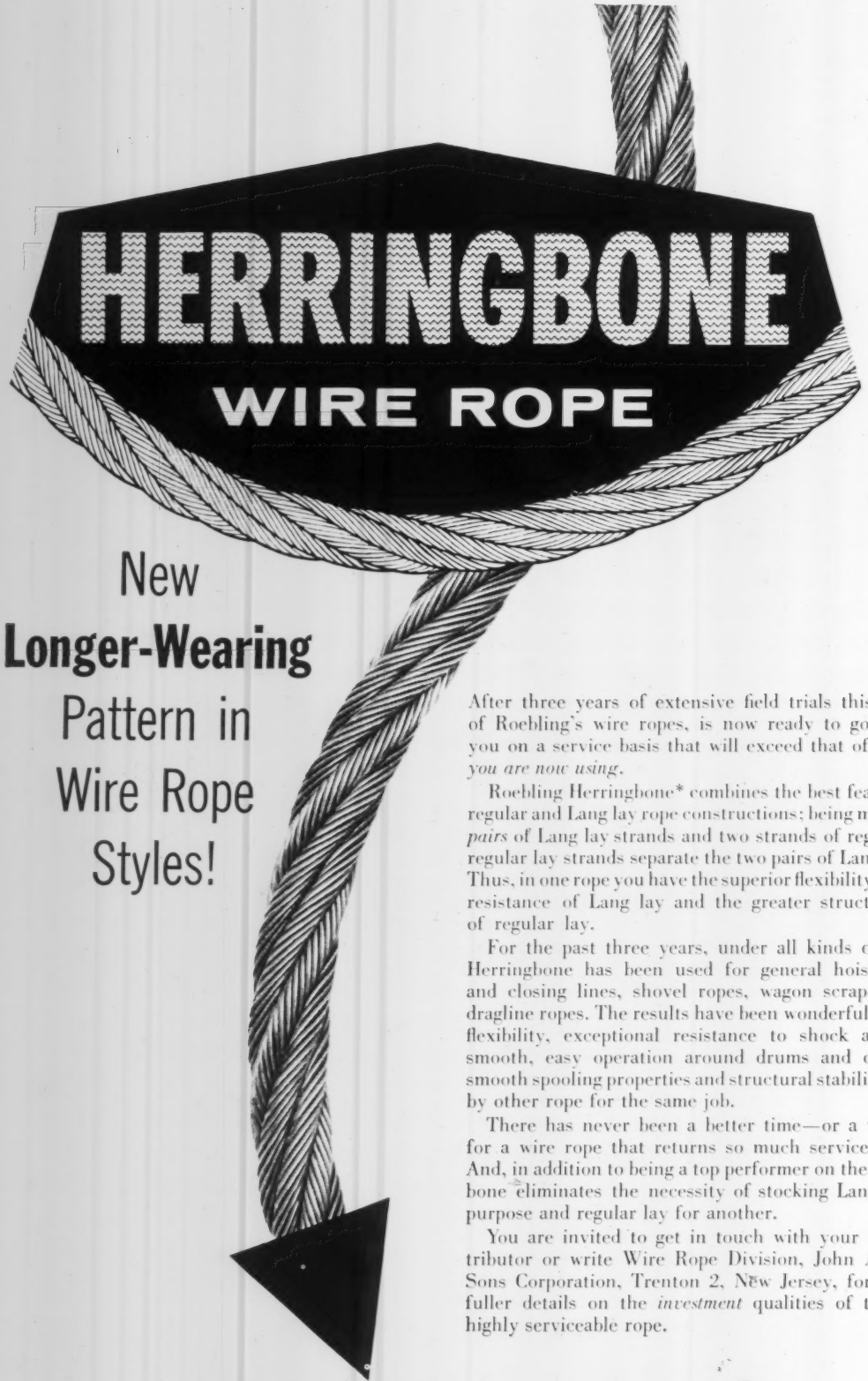
Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio



New **Longer-Wearing** Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using.*

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two *pairs* of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

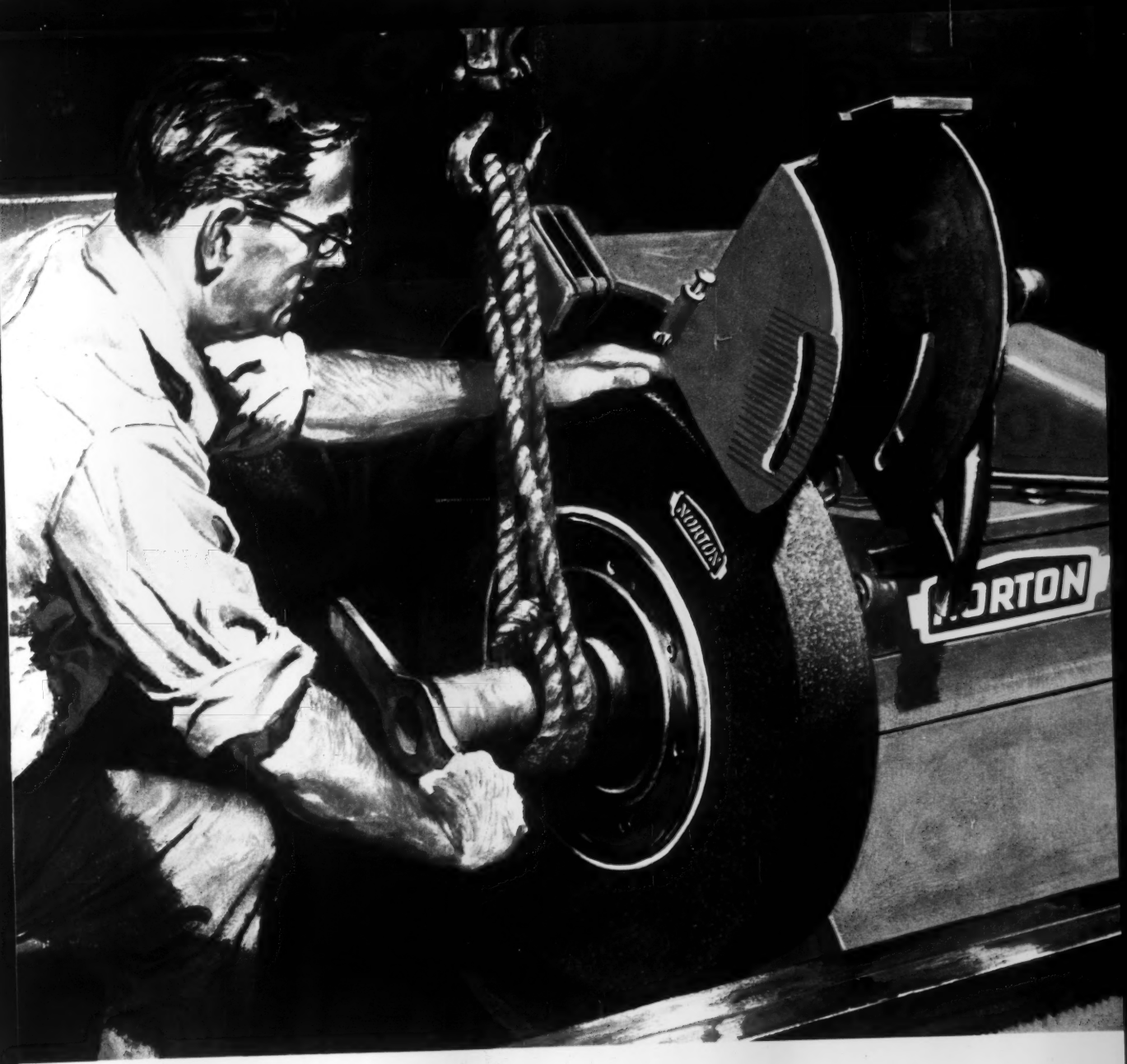
There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation



He's equipping this machine with the "Touch of Gold"

Grinding is always a profit-producing step in metal working. That's why the grinding wheel itself is so important — and why Norton world leadership in grinding is important to you when you specify grinding wheels.

Because a Norton wheel, contacting the work in process, is always adding the "Touch of Gold" . . . creating value and usefulness through improving the fit and finish of the product. The right wheel for each job is the key to having each job done right . . . which is the real secret of profitable production. And Norton stocks more than 200,000 types and sizes of grinding wheels to make your "Touch of Gold" quickly available. Plants and distributors all around the world.

NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

NORTON
ABRASIVES

Making better products . . . to make your products better

2 to 3 times
Greater Thrust Capacity

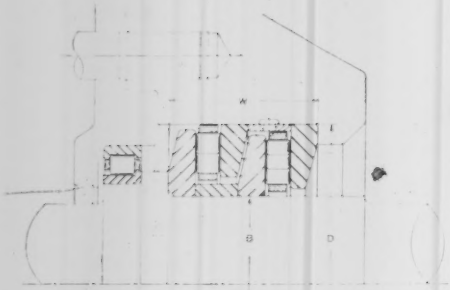
8 to 12 times
Longer Life Expectancy

New ROLLWAY TANDEM THRUST BEARING

Using axial space along the shaft, rather than enlarging the housing diameter, this new Rollway tandem thrust bearing distributes the load over two or three stages of roller components. Gives 2 to 3 times more thrust capacity than conventional thrust bearings. Life expectancy is 8 to 12 times longer depending upon the number of stages.

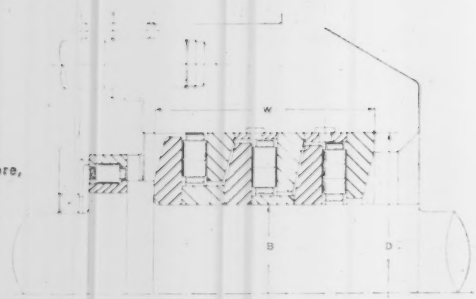
Each stage comprises a rotatable bearing plate . . . a bronze retainer with thru-hardened steel rollers . . . a compression sleeve . . . and a stationary bearing plate. The thrust load is applied to the first stage and is by-passed by each compression sleeve in turn to the remaining stage or stages.

Calculated deformation of the bearing plates distributes the load uniformly on all rollers. A greater number of rollers in the first stage carries about 60% of the load, without increasing the load per roller. Compression sleeves have cross-sectional areas proportional to the load imposed. Roller variance is held within one ten-thousandth inch.



✓ **TWO STAGE TANDEM**

22 sizes, up to 17" bore, 34" O.D., and 2,325,000 lb. capacity at 100 rpm



✓ **THREE STAGE TANDEM**

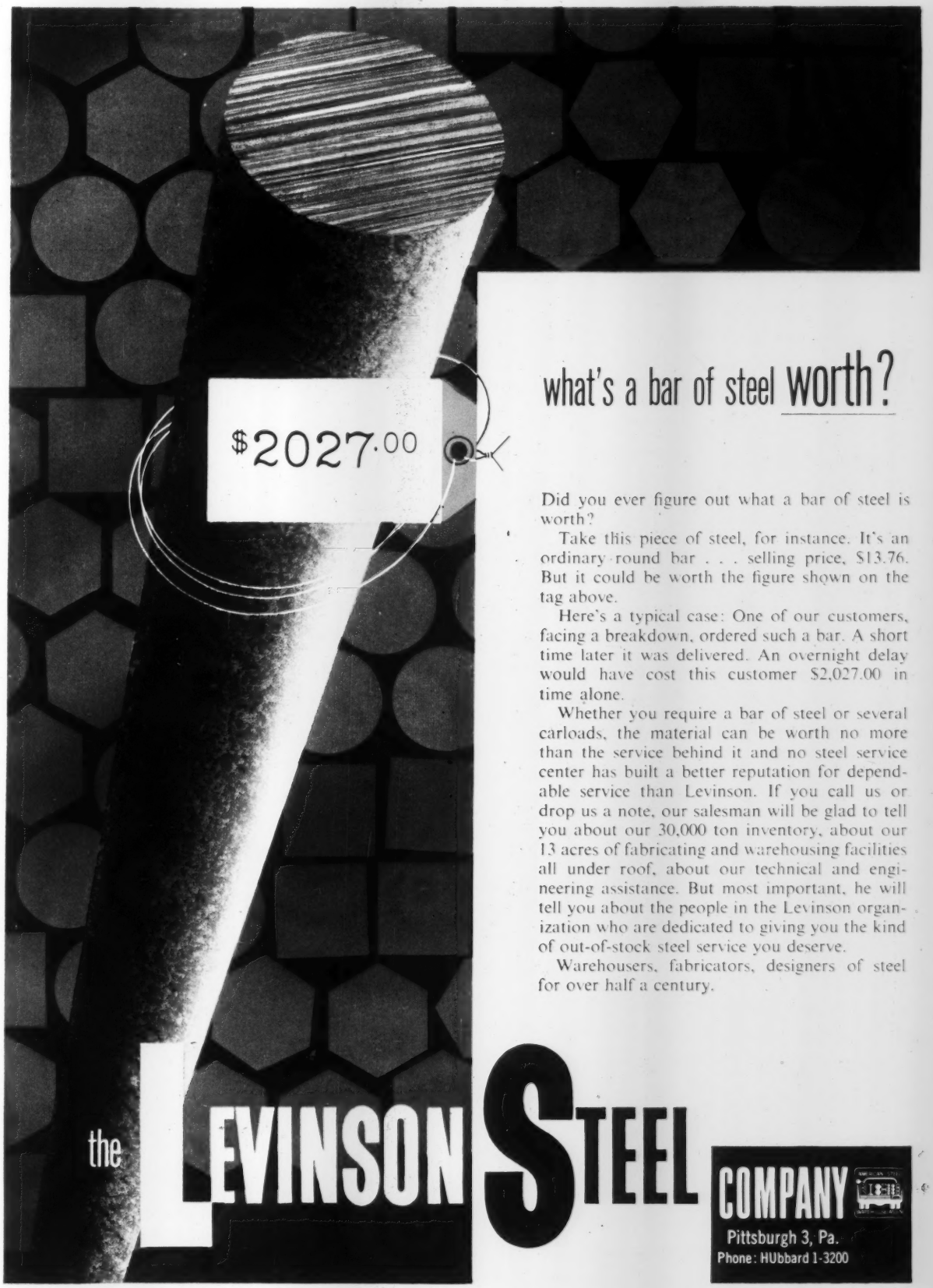
5 sizes, up to 17" bore, 34" O.D., and 3,410,000 lb. capacity at 100 rpm

Complete Specifications on Rollway Tandem Thrust Bearings, as well as other up-to-date information on bearing design is yours for the asking. See your Rollway engineer, or write: Rollway Bearing Company, Inc., Syracuse, N. Y.

Tandem Thrust Bearing manufactured by Rollway Bearing Company, Inc. under U.S. Patent Number 2,374,820.

ROLLWAY®
BEARINGS
COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ENGINEERING OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • San Francisco • Boston • Detroit • Pittsburgh • Houston • Philadelphia • Los Angeles



what's a bar of steel worth?

Did you ever figure out what a bar of steel is worth?

Take this piece of steel, for instance. It's an ordinary round bar . . . selling price, $13.76. But it could be worth the figure shown on the tag above.

Here's a typical case: One of our customers, facing a breakdown, ordered such a bar. A short time later it was delivered. An overnight delay would have cost this customer $2,027.00 in time alone.

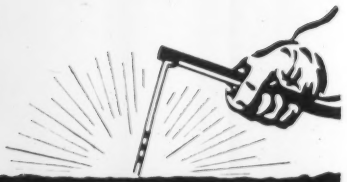
Whether you require a bar of steel or several carloads, the material can be worth no more than the service behind it and no steel service center has built a better reputation for dependable service than Levinson. If you call us or drop us a note, our salesman will be glad to tell you about our 30,000 ton inventory, about our 13 acres of fabricating and warehousing facilities all under roof, about our technical and engineering assistance. But most important, he will tell you about the people in the Levinson organization who are dedicated to giving you the kind of out-of-stock steel service you deserve.

Warehousers, fabricators, designers of steel for over half a century.

the LEVINSON STEEL COMPANY

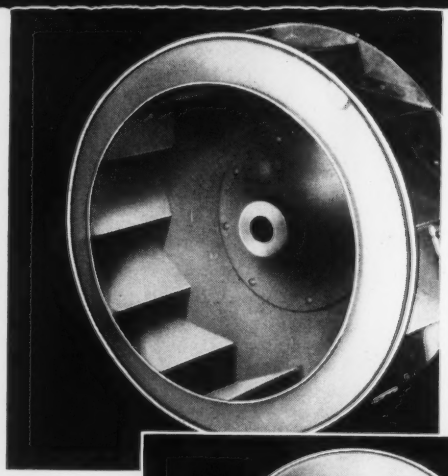
Pittsburgh 3, Pa.
Phone: HUbbard 1-3200

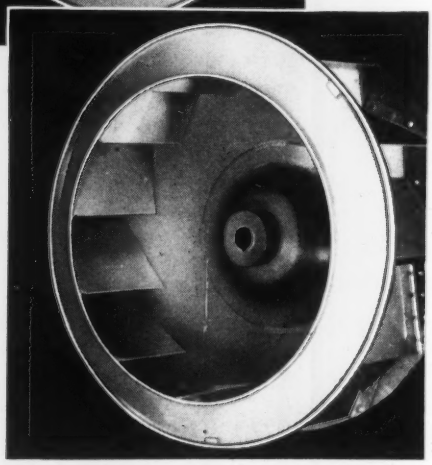
Weldynamics



ARC WELDING AT WORK CUTTING COSTS

Switch from cast iron to welded steel saves 61% on blower hubs





Because steel is 3 times stronger, 2½ times more rigid and costs ⅓ as much as cast iron a blower manufacturer was able to cut costs of blower hubs 61%.

Additional advantages of welded steel are:

- 42% lighter permitting use of lighter bearings and shafts
- Higher maximum speeds—no danger of fracture
- Easier balancing
- Better appearance

Your product can be made better at less cost with welded Steel. A Lincoln man trained in Weldynamics will help you. Call or write.

(Top) *Blower rotor with cast iron hub attached by rivets.*

(Bottom) *Same size rotor with welded and spun steel hub attached by intermittent welds.*

DESIGN AIDS!

"Procedure Handbook of Arc Welding Design and Practice" new 11th edition has 1300 pages, 1100 illustrations, 240 pages on Machine Design. $3.00 postpaid in U.S.A., $3.50 elsewhere.

Send for Machine "Design Ideas", free to engineers and supervisors.

Machine Design Seminars, conducted at our Cleveland Plant.

The World's Largest Manufacturer of Arc Welding Equipment

© 1958 The Lincoln Electric Company

THE LINCOLN ELECTRIC COMPANY • DEPT. 1647 • CLEVELAND 17, OHIO

Big Paul digs and dumps 105 tons in 50 seconds!

USS "T-1" and TRI-TEN Steels cut dead weight—boost strength

Even from a 100-foot-high perch, the mammoth size of the bucket of Big Paul, the King of Spades, is hard to comprehend.

There are three of these 70-yard giants—all built by Marion Power Shovel Company. All achieve strength and toughness with least weight by the use of USS "T-1" Constructional Alloy Steel and USS TRI-TEN High-Strength Low-Alloy Steel.

Big Paul sets the pace at the Peabody Coal Company's River King mine near Freeburg, Illinois. It rams through rock and shale to uncover some two million tons of coal per year.

Since 1950, the art of big shovel making has increased dipper size from 35 to 45, 55, 60, and now 70 cubic yards per bite. Most of the buckets and dipper sticks of these giant shovels are made of USS "T-1" Steel, for otherwise, it would be almost impossible to make them light enough and tough enough. They hold up in this service, taking terrific impact abrasion and shock loading, even in the dead of winter. This is possible because USS "T-1" Steel retains its toughness at temperatures far below zero.

Dipper Size Increased 25%

USS "T-1" Steel has often enabled a boost in the capacity of original equipment without increasing weight. For example, a 20-yard bucket was replaced with a 24-yard "T-1" Steel job. Other dippers were boosted from 26 yards to 32, and 36 yards to 45—increases of 25%.

Many other parts—dipper stick, bail handles and crowd rack—are built stronger and lighter with this 90,000 psi minimum yield strength constructional alloy steel. (USS "T-1" Steel plates up to $2\frac{1}{2}$ inches thick inclusive are *now* available with a minimum yield strength of 100,000 psi.)

The booms and A-frames of most shovels over 45 yards are designed with high-strength low-alloy steels with 50,000 minimum yield point . . . usually USS TRI-TEN Steel.

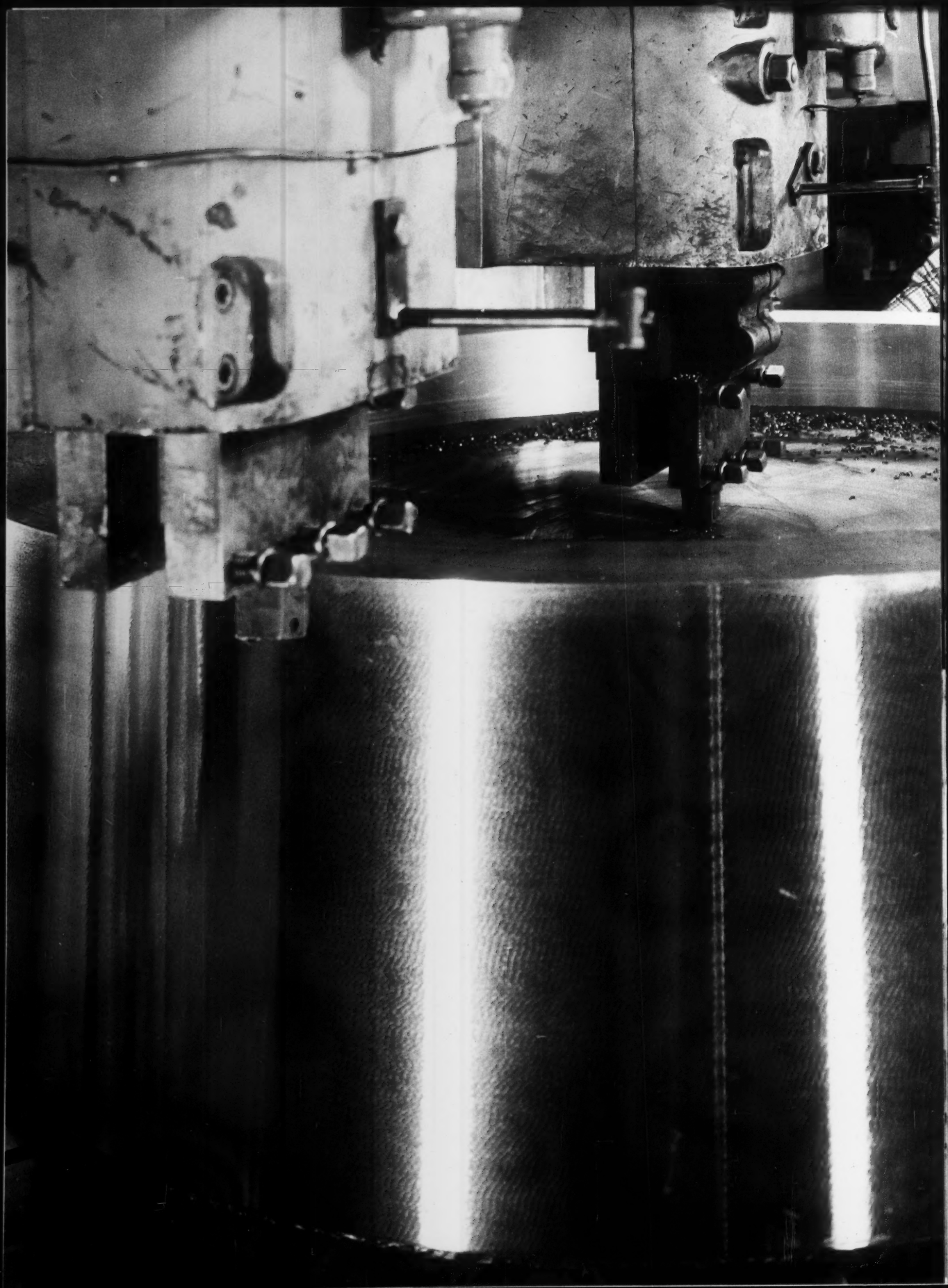
Perhaps you need a steel that offers higher yield strength, extraordinary toughness and resistance to impact abrasion, combined with relative ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your application. For free booklet, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania

USS, "T-1" and TRI-TEN are registered trademarks

◀ 70-yard dipper and handle, crowd rack, bail and sheave blocks—all built stronger and lighter with USS "T-1" Steel

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

United States Steel



12 tons of forged steel for Yankee fission

The picture shows a steam generator tube sheet forging (one of four) destined for a 134,000-KW nuclear-fueled power plant owned by the Yankee Atomic Electric Company, in Rowe, Massachusetts.

It's a $50-million plant that uses a pressurized water reactor. The USS Quality Forging tube sheet is 85" in diameter by 26 5/16" thick. Some 1600 holes will be drilled through the forging longitudinally, and in these holes will be placed stainless steel tubes which will carry high pressure, high temperature main coolant water.

The forged tube sheet is made from carbon steel with a pinch (.057%) of vanadium in it. Starting from the raw ingot, it was heated, forged, rough machined, normalized, tempered, rough machined again, then quenched and tempered. It received a great variety of tests along the way—including several ultrasonic tests. The forging, as shipped, weighed 25,500 pounds.

Nuclear power plant designers have known from the beginning that it is extremely important to use highest quality components. That's the reason why they come so often to United States Steel for its justly famous USS Quality Forgings. And although the one shown here is not complicated, the Forgings Division of USS Homestead District Works has produced a great many complex forgings in everything from carbon to stainless steel, including discs, tapered domes, flanges and cylinders of all types.

No matter what kind of a forging you need, isn't it a good feeling to know that the men who will make it have a solid background of experience? We'd appreciate your inquiries or requests for our free folder on USS Nuclear Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

USS

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

United States Steel

ATLAS LUMNITE

IN REFRACTORY CONCRETE DOME:

Circular Revolving Hearth Furnace featuring an unusual inner dome constructed with a castable refractory bonded with LUMNITE calcium-aluminate cement. Furnace diameter is 17 feet. 9" thick concrete dome has 289 holes (5" diameter). Heat passes downward through dome openings to anneal shells in furnace.

. . . for low-cost furnace construction and maintenance

- Refractory concrete (with ATLAS* LUMNITE cement) stands up under continuous soaking heat . . . protects against thermal shock due to heating-cooling cycles . . . provides insulation.
- Easy, economical to place . . . by precasting, troweling or guniting . . . concrete reaches high strength 24 hours after placing.

For maximum convenience, use castables made with LUMNITE* cement. These are packaged mixtures, ready for use. Simply add water, mix and place. Made and distributed by leading manufacturers of refractories.

Write for "Lumnite Refractory Concrete Manual"
Universal Atlas, 100 Park Avenue, New York 17, N. Y.

UNIVERSAL ATLAS CEMENTS

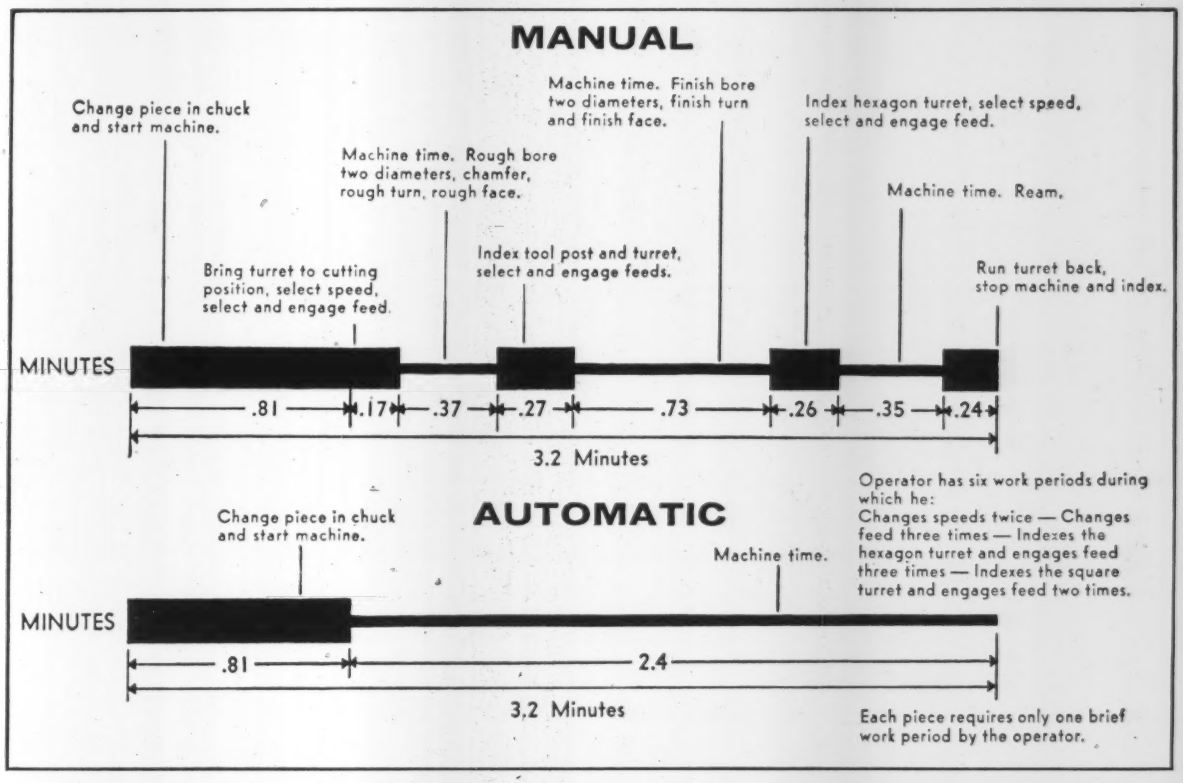
Universal Atlas Cement
Division of United States Steel

USS

*TRADE MARK

L-176

OFFICES: *Albany · Birmingham · Boston · Chicago · Dallas · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*


MANUAL
Change piece in chuck and start machine.
Machine time. Rough bore two diameters, chamfer, rough turn, rough face.
Machine time. Finish bore two diameters, finish turn and finish face.
Index hexagon turret, select speed, select and engage feed.
Machine time. Ream.
Bring turret to cutting position, select speed, select and engage feed.
Index tool post and turret, select and engage feeds.
Run turret back, stop machine and index.
MINUTES
.81
.17
.37
.27
.73
.26
.35
.24
3.2 Minutes
AUTOMATIC
Operator has six work periods during which he:
Changes speeds twice — Changes feed three times — Indexes the hexagon turret and engages feed three times — Indexes the square turret and engages feed two times.
Change piece in chuck and start machine.
Machine time.
MINUTES
.81
2.4
3.2 Minutes
Each piece requires only one brief work period by the operator.

How the new Gisholt Fastermatic makes you

MORE MONEY DURING MACHINING TIME

Drastic reduction of operator time in machine handling —that's the story behind the success of the new Gisholt Fastermatic Automatic Turret Lathe.

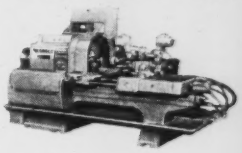
Evidence? Look at the chart above. *Compare* the time and work cycle of a manually operated turret lathe with a Gisholt Fastermatic—*on the same job.*

The piece, a wheel hub, is rough-bored, finish-bored, reamed, rough-faced, finish-faced and chamfered. Both cross slides and three hexagon turret faces of the Fastermatic are used. Identical tooling on the other three hexagon turret faces permits finishing two parts with each complete index of the turret.

The contrast is startling. The manually operated machine takes over 54% of the operator's time...the Fastermatic takes only 25%! The operator's "free time" is doubled—giving him ample time to keep another Fastermatic under cut on a similar operation *and also* inspect and stack finished parts or perform other work.

You may have jobs where the new Fastermatic can show even greater savings. Let Gisholt help you find out —mail the coupon now.

A COMPLETELY NEW MACHINE. New selector-switch control panel on Gisholt Fastermatic reduces setup time 50% or more. Operator simply chucks piece, starts automatic cycle, removes completed part. Human error is eliminated. Operator is free during machine cycle to handle additional units or to do other work. New Fastermatic is quick and easy to set up; no cams to change. Ideally suited for long- or short-run operations. Increased power, higher spindle speeds permit more efficient use of today's cutting tools. *Investigate now.*



GISHOLT MACHINE COMPANY

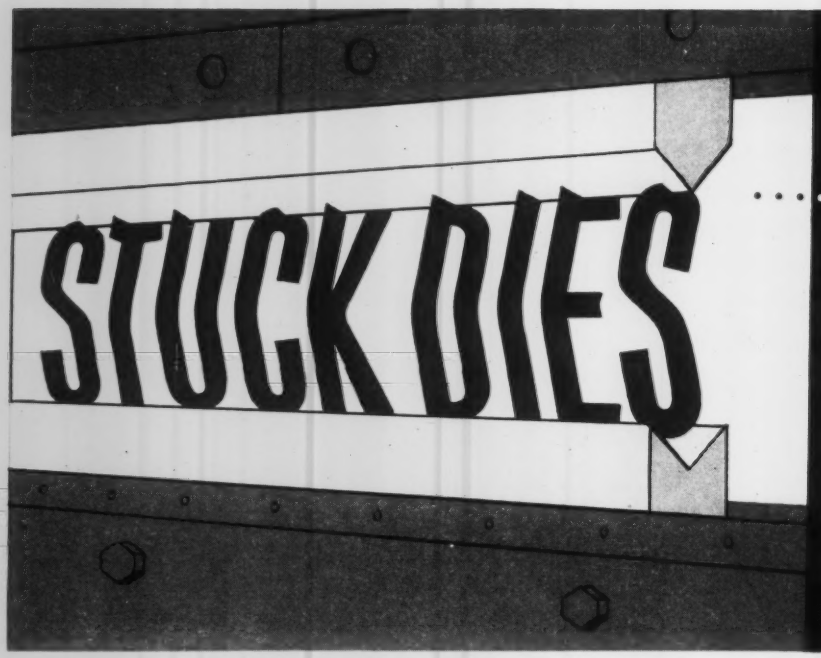
Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE

Gisholt Machine Company
1217 E. Washington Ave.
Madison 10, Wisconsin

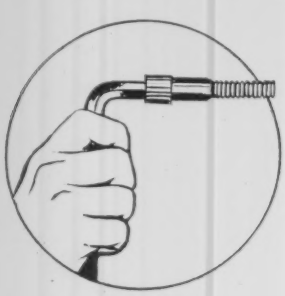
☐ Send new Fastermatic Catalog 1179-A.
☐ Have Gisholt Representative call.

Name..... *Title*.....
Company.....
Street Address.....
City..... *State*.....

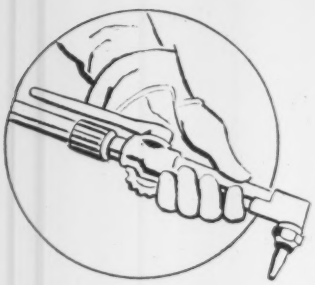


. . . . quickly, easily released with exclusive patented LODGE & SHIPLEY

WEDGE TYPE RAM PRESSURE RELEASE

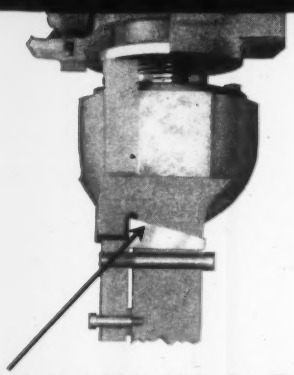


THIS . . .



NOT THIS!

- Use wrench . . . . . not a cutting torch
- in minutes . . . . . instead of hours
- without damage . . . . die holder destroyed

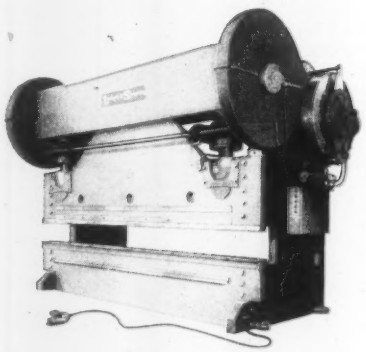


The Lodge & Shipley Wedge Type Ram Pressure Release is unusually simple and rugged in design. A heavy steel wedge has a top angle that complements a similar angle on the base of the ram pittman socket housing. Held securely by a heavy steel plate, the wedges can be released quickly to provide up to ¼" additional clearance.

When a press brake is stalled due to improperly adjusted dies . . . do you face a short delay or near disaster?

With a Lodge & Shipley Press Brake, release of the stuck dies is a quick, simple, non-destructive matter as described in the accompanying detail.

This is but one of many outstanding Lodge & Shipley Press Brake features designed for fast, accurate, efficient and dependable press brake operation. New literature gives complete details. Write: **The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.**



Lodge & Shipley *. . . your Lodge-ical choice*

TIGHTEN UP ON COSTS OF SEALING CORROSIVES

Time spent repacking or adjusting stuffing boxes, is the big cost of sealing against corrosives. To minimize maintenance Garlock offers the products illustrated for sealing against corrosives.

LATTICE BRAID* Teflon† PACKINGS

USERS REPORT:

CHEMICAL INDUSTRY—Centrifugal dye pumps required repacking every 24 to 48 hours. Switched to Garlock LATTICE BRAID asbestos with Teflon impregnation.

RESULTS: Minimum 3 months service. All the strands of this unique packing are lattice linked together into one structural unit. Each strand is impregnated with chemically inert Teflon for longer wear.

OIL INDUSTRY—On pumps handling blending waxes at 170° F. to 200° F., LATTICE BRAID Teflon packing lasts 8 to 10 times longer than other packings. Reason? Packing is *unaffected* by either the hot waxes or the steam used in cleaning the pumps.

Teflon impregnated LATTICE BRAID packings are another example of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. The only complete line. That's why your Garlock representative can give you unbiased recommendations. Call him or write for Folder AD-131.

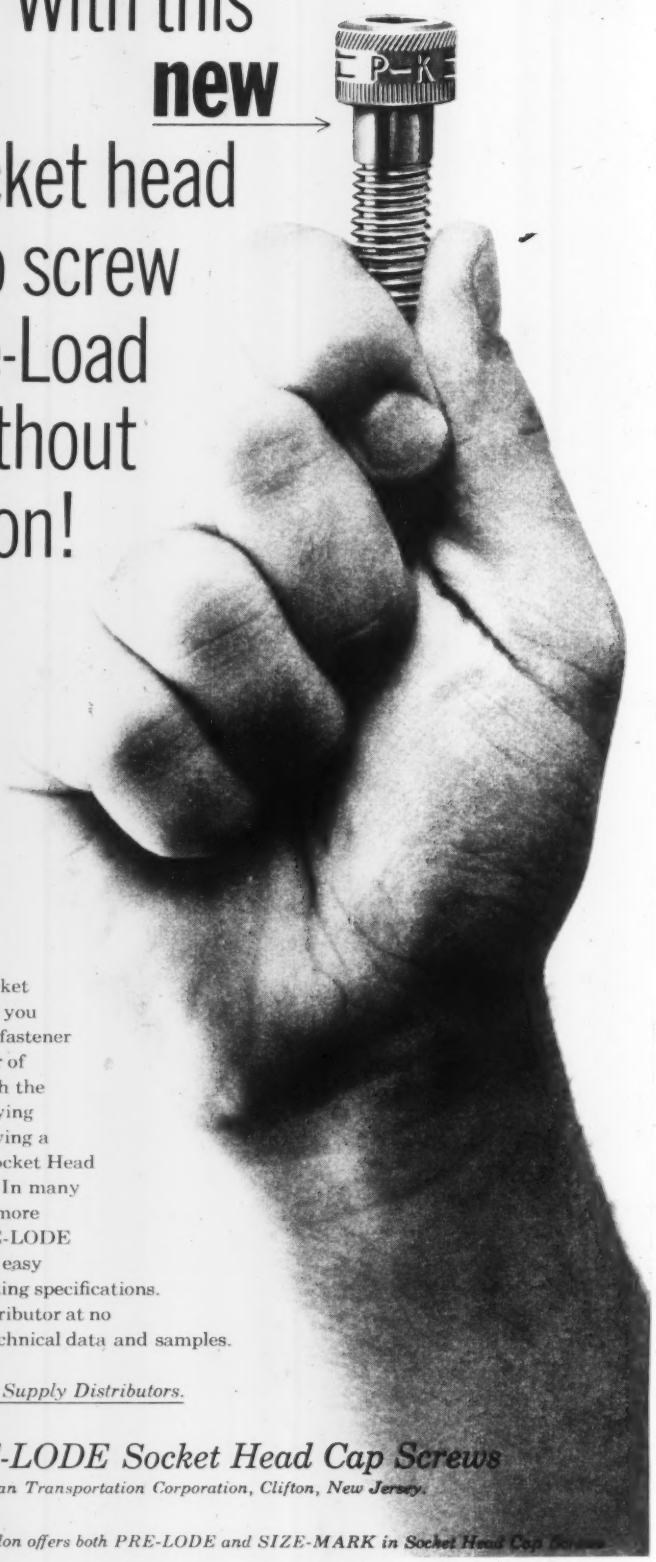
* Garlock trademark
† Dupont trademark

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.
For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U. S. and Canada.

With this **new** socket head cap screw you can Pre-Load without indentation!



the new P-K® PRE-LODE

Now . . . Parker-Kalon's new PRE-LODE Socket Head Cap Screw gives you *greater bearing surface under the head than ever before!* With this new head, a research achievement resulting from the combined efforts of the Socket Screw Manufacturers' Technical Committee, you can now apply higher torque . . . pre-load the fastener for maximum holding power without danger of marring or indenting softer materials in which the screw engages. This means greater load carrying capacity and better functioning in holes having a greater body clearance. P-K's PRE-LODE Socket Head Cap Screws are designed for high tightening. In many cases, the socket has been enlarged to allow more wrenching area. Standard sizes ¼" to 1" PRE-LODE Socket Head Cap Screws are *Size-Marked* for easy identification, and are manufactured to exacting specifications. Available now from your authorized P-K distributor at no increase in cost. Write today for complete technical data and samples.

Sold Everywhere Through Leading Industrial Supply Distributors.

PARKER-KALON® *PRE-LODE Socket Head Cap Screws*

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, New Jersey.

Only Parker-Kalon offers both PRE-LODE and SIZE-MARK in Socket Head Cap Screws

Ingersoll Steel Deliveries

TIMED TO YOUR PRODUCTION

Here at Ingersoll Steel we knock ourselves out to give you on-time, as-promised delivery of a wide variety of special purpose steel sheets and plates. The minute your order is received it starts getting the V.I.P. treatment—and that's the way it goes all the way to your receiving department.

Being a specialty mill, we can and do adjust our production schedules to dovetail with your production needs. And with our advantageous central location at New Castle, Indiana, prompt deliveries are assured. Next time you need any of the products listed below, call Ingersoll Steel and you'll see what we mean.

Ingersoll Produces:

STAINLESS STEELS • HEAT RESISTING STEELS • INGACLAD STAINLESS-CLAD SHEETS • ALLOY STEELS • FORGING QUALITY ELECTRIC STEEL INGOTS • AUTOMOTIVE CLUTCH PLATE STEELS TEM-CROSS CROSS-ROLLED STEEL • CARBON ELECTRIC STEEL FOR TRACTOR CLUTCH DISCS • KNIFE STEELS • SAW STEELS HIGH SPEED HACK SAW STEELS • SOFT CENTER AND OTHER AGRICULTURAL STEELS • SPECIAL ANALYSIS STEELS

INGERSOLL STEEL B-W BORG-WARNER ®

Ingersoll STEEL DIVISION

Borg-Warner Corporation

New Castle, Indiana

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

has over 50 years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

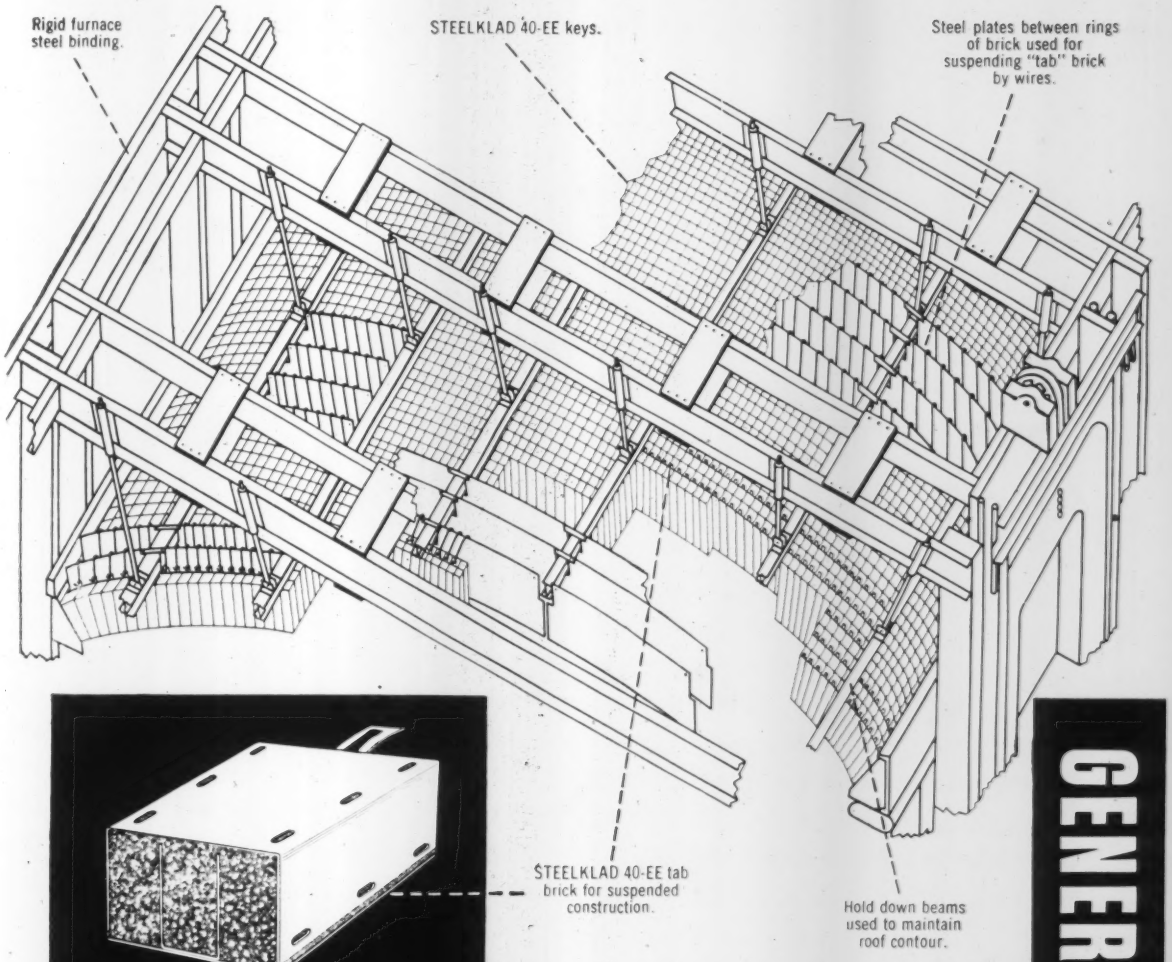
Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

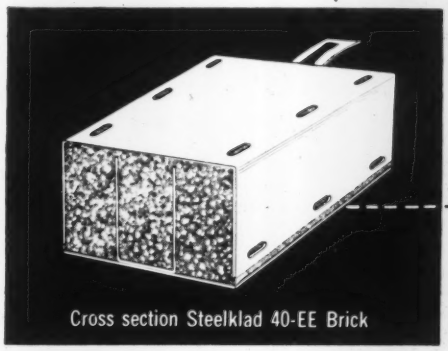
Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES


Rigid furnace steel binding.
STEELKLAD 40-EE keys.
Steel plates between rings of brick used for suspending "tab" brick by wires.
STEELKLAD 40-EE tab brick for suspended construction.
Hold down beams used to maintain roof contour.


Cross section Steelklad 40-EE Brick

Breakthrough in Steelmaking...

Basic refractory brick—pioneered by Grefco—has produced a breakthrough in modern steelmaking. Previously, the advantages of greater steel production at lower cost, brought about by improved operating techniques and greater use of oxygen, were largely offset by the fact that conventional refractories could not withstand the far higher temperatures and stresses that resulted. Only "All-Basic" furnaces (i.e., furnaces completely lined with basic refractory brick) can endure these more punishing production schedules without costly shutdowns for repairs.

As a result, there are or soon will be in operation in North America more than 75 "All-Basic" furnaces with roofs of GREFCO "STEELKLAD 40-EE", the original internally-plated basic brick.

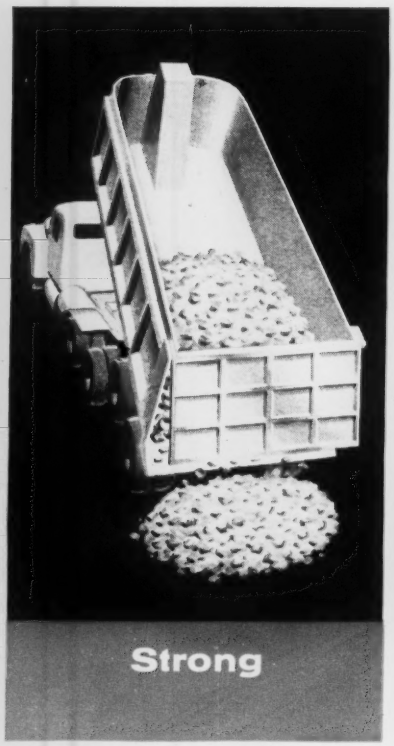
Grefco technical and sales service personnel will be glad to provide you with the basic brick exactly tailored to your needs, and with the know-how and experience that make Grefco the industry leader in basic refractories.

GENERAL REFRACTORIES COMPANY
Philadelphia 2, Pa.

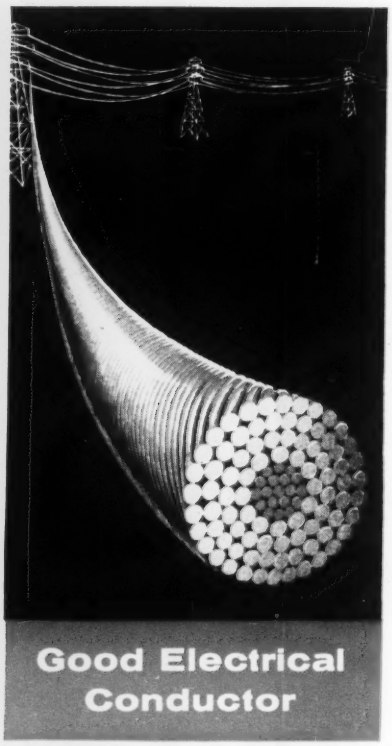
A COMPLETE REFRACTORIES SERVICE

GENERAL REFRACTORIES

Light Weight



Strong



Good Electrical Conductor

ALUMINUM...*Design-able*

There is probably no one metal with so many favorable characteristics, offering so much to so many applications, as aluminum. It is the *combination* of these characteristics that helps aluminum to improve products, parts, and their production.

As proof of this, consider the staggering growth in usage that this versatile metal has enjoyed just since 1946—over 2 *billion* pounds more aluminum used in 1957 than in 1946. Consider, too, a few of the properties aluminum offers a designer:

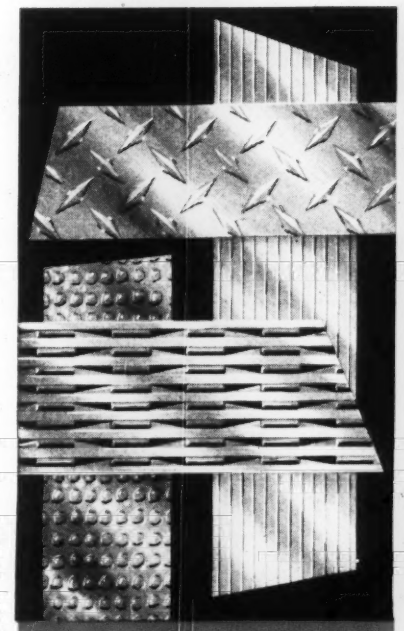
Light Weight—Weighing ⅓ as much as copper, steel and brass, aluminum offers a big advantage for many products where weight is important. Light weight can also mean lower labor costs, lower costs in shipping, handling and installation. And you can get three times as many parts from a pound of aluminum as from a pound of the other metals.

High Strength—Some aluminum alloys are stronger than structural steel. Aluminum alloys are being used in rugged applications like dump truck bodies, building structurals and highway bridges.

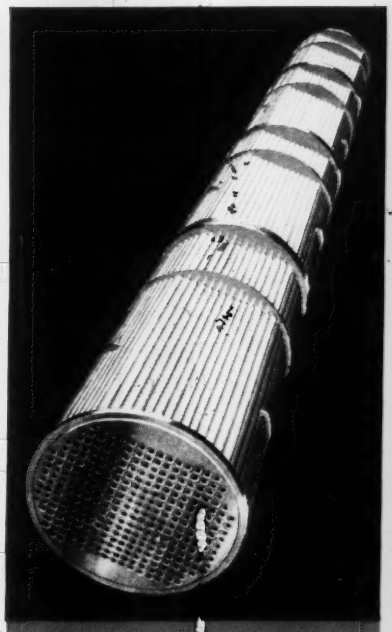
Good Electrical Conductor—One of the main reasons you see more and more aluminum in cable, transformer windings, switches, motors, capacitors, and bus duct is its conductivity. One pound of aluminum is equal *electrically* to two pounds of copper. This conductivity, plus its light weight, strength, and workability, makes aluminum an important cost-cutter in electrical equipment and systems.

Finish Variety—No other metal can be finished in so many different ways, for so many different effects. You can achieve a brightly-colored or clear finish by anodizing. Aluminum can also be electroplated, painted, porcelainized.

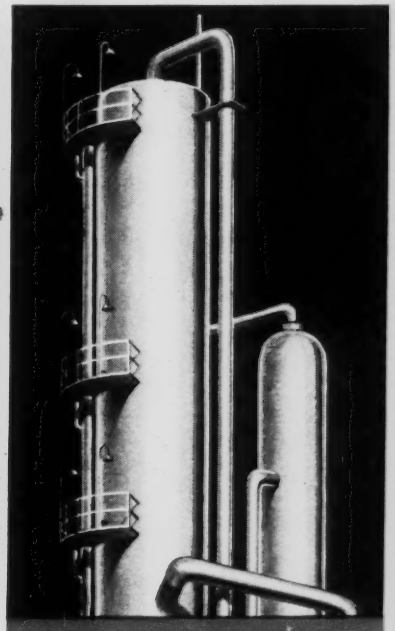
REYNOLDS



Easily Machined and Finished



High Thermal Conductivity



Corrosion-Resistant

because it's versatile

You can finish aluminum by polishing, buffing, embossing, scratch-brushing, spin finishing—by just about any mechanical method. Or you can leave it unfinished, and still have an attractive product.

High Thermal Conductivity—Aluminum conducts heat rapidly and efficiently, thus, it is ideal for air-cooled engines, heat exchange elements, evaporators, cooking utensils. Another characteristic of aluminum is its low emissivity—it retains heat, making it more efficient for air ducts.

Corrosion-Resistance—Aluminum won't rust. But equally important is the fact that aluminum will keep its brightness and strength when handling many chemical agents that attack other metals. This is why so much aluminum piping, jacketing, tanks, vessels, and structurals are used in the chemical and petroleum fields.

Get the details on all of the characteristics and properties of aluminum and its alloys, and on how it can improve your products, cut your costs. Contact the Reynolds Design and Engineering Service, through your local Reynolds office.

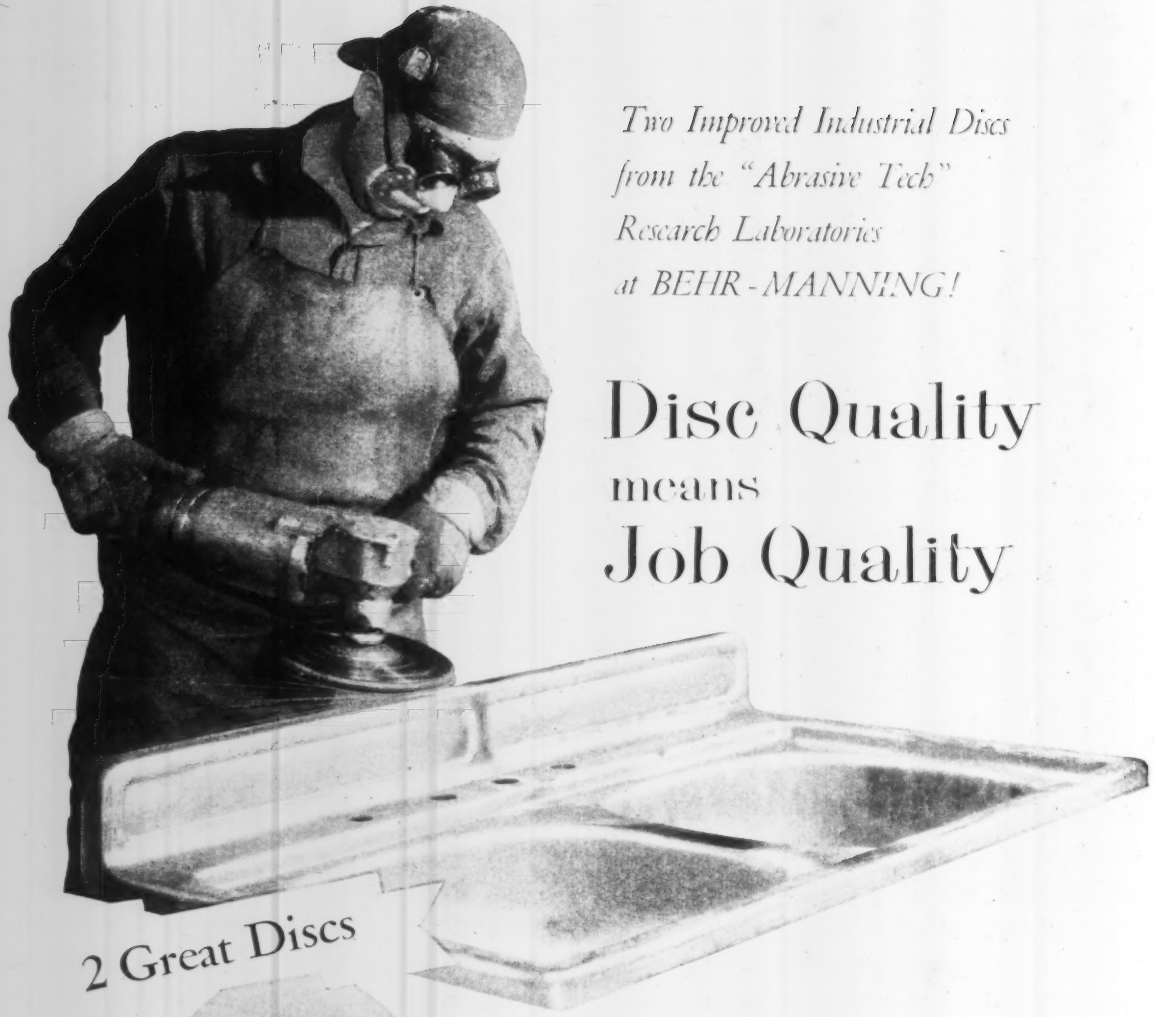
Reynolds Metals Company, P.O. Box 2346-HL, Richmond 18, Virginia.

Watch Reynolds new TV shows
"WALT DISNEY PRESENTS" and **"ALL-STAR GOLF"**
every week on **ABC-TV.**

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY

ALUMINUM



Two Improved Industrial Discs from the "Abrasive Tech" Research Laboratories at BEHR-MANNING!

Disc Quality means Job Quality

2 Great Discs

Rugged "81 Coat" insures maximum cutting life and an even rate of cut

Now you have a choice of two quality discs, "91 Coat" and "81 Coat" SPEED-WET METALITE Fibre. In today's highly competitive market you need a coated abrasive disc designed specifically for the job. BEHR-MANNING invites you to test either or both discs in your plant. Your local BEHR-MANNING Field Engineer will be glad to arrange for test samples or, if you prefer, write to BEHR-MANNING CO., Troy, N. Y., Dept. DT-15.

BEHR-MANNING CO.

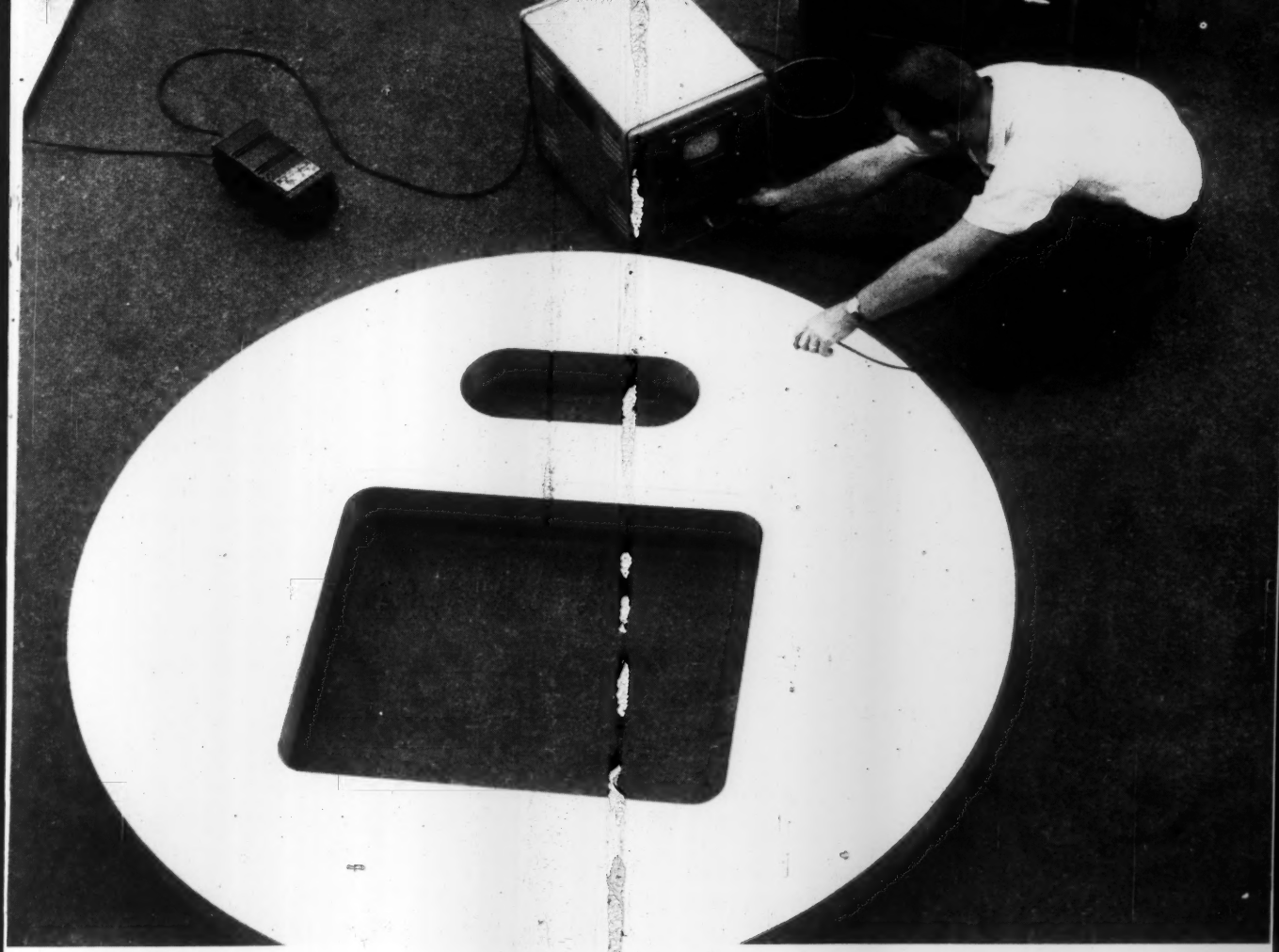
TROY, NEW YORK

A DIVISION OF NORTON COMPANY

NORTON ABRASIVES

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals
In Canada: Behr-Manning (Canada) Ltd., Brantford. For Export: Norton Behr-Manning Overseas Inc., Troy, N. Y., U. S. A.

IA-8



"test soundings"

. . . prove the soundness of Carlson stainless steel plate

"HEAVING THE LEAD" may be the traditional way to keep a boat off the shoals, but modern sound wave instruments do it faster and better. And, for a very different reason, modern sound wave devices are used to assure quality stainless steels. Carlson was one of the first producers to use ultra-sonic equipment for testing heavy gauge stainless plate.

In ultra-sonic testing, sound waves take a penetrating look inside and positively determine structural quality. A complete report on the results of the test is supplied to the customer. By specifying ultra-sonic tested plate, builders of aircraft components and nuclear equipment can tell in advance that the material will meet their rigid requirements.

Ultra-sonic is only one of the many tests used to maintain the high quality of Carlson stainless plate. The final, and most important test, is when *you* get repeat orders from *your* customers.

Write, wire or phone for complete information on all Carlson services.

G. O. CARLSON Inc.

Stainless Steels Exclusively

122 Marshalton Road
THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

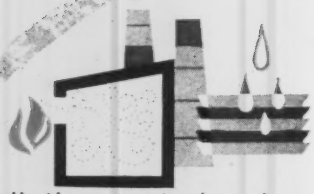
PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS AND SHEETS (No. 1 Finish)

KAISER ENGINEERS

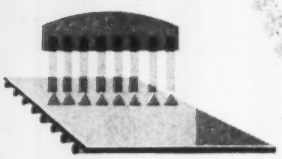
—has designed and built,

—is designing and building,

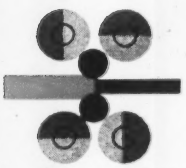
—will design and build...



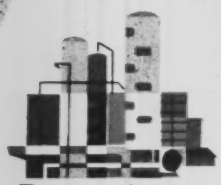
Air pollution control and water treatment



Sinter plants



Rolling mills



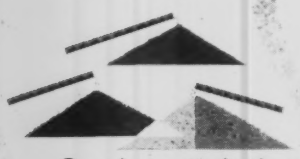
By-products plants

Kaiser Engineers designs and builds every part of a steel mill. Been doing it for years. KE has the experience, and the ingenuity, to develop time-cutting, cost-saving new ways to build and operate. The result is a better plant, sooner, for less.

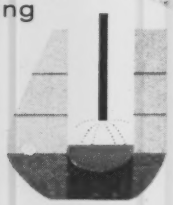
Experience, ingenuity—and a cost-conscious approach. This is what KE can apply to your steel plant expansion program right now. Call or write—today.

Pittsburgh, 330 Grant St., AT 1-7992
New York, 300 Park Ave., PL 9-1100
Oakland, 1924 Broadway, CR 1-2211

Open hearths



Ore beneficiation and handling



L-D Process plants

Blast furnaces

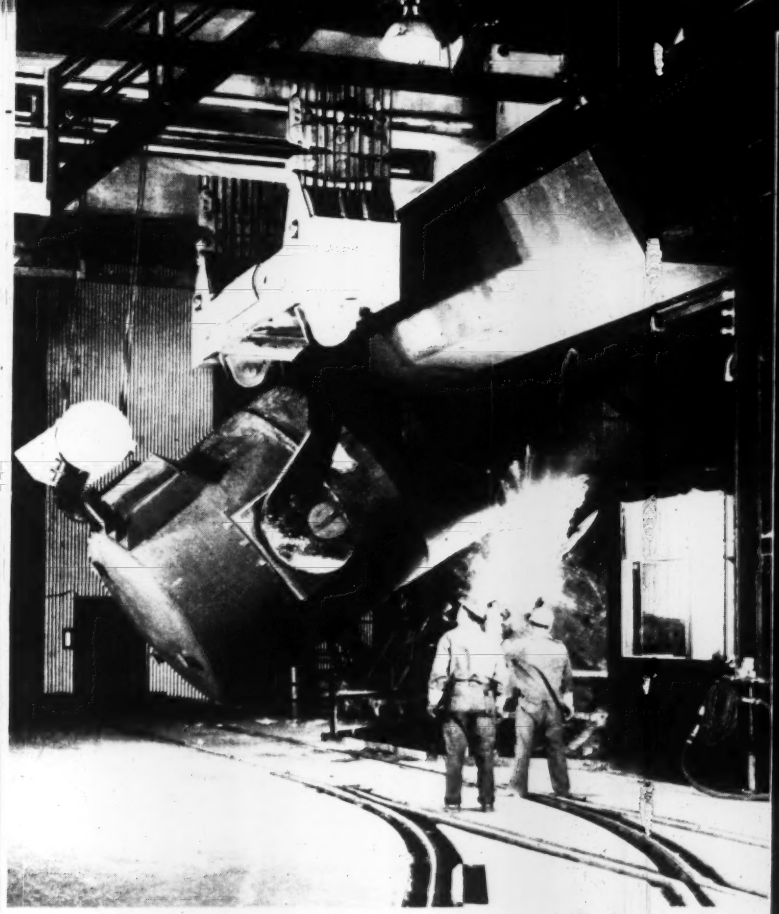
Pipe mills

KAISER ENGINEERS

KAISER ENGINEERS engineers-contractors

Contracting since 1914

Division of Henry J. Kaiser Company · Oakland 12, California · New York, Pittsburgh, Washington, D. C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo

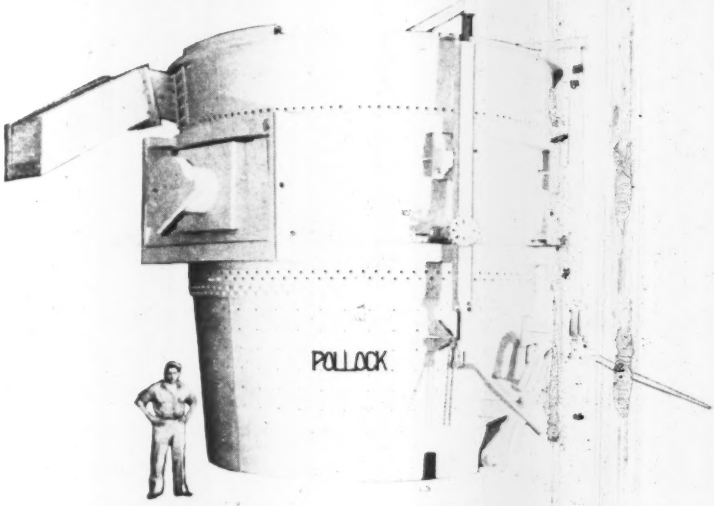


80-ton capacity Pollock ladle pouring iron charge into one of the new basic oxygen furnaces at the Aliquippa Works Division of Jones & Laughlin Steel Corporation.

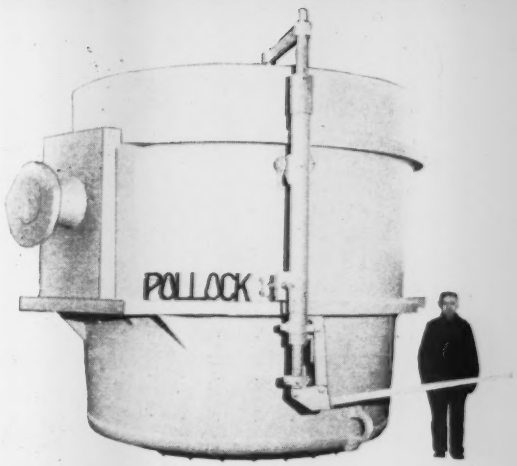
The Industry's STANDARD

POLLOCK LADLES

Pollock ladles, like the one at left, are engineered for the jobs they do. This one was engineered and built for the Jones & Laughlin Steel Corporation, Aliquippa Works Division, to transport molten iron from the mixer ladle to the new basic oxygen process furnace. Its integral spout eliminates the old-fashioned runner used in most pouring operations, and the feet mounted on the ladle base make the ladle free standing. Pollock also built the ladles to receive the steel from the new furnaces. When you plan new facilities or increased capacity in your present plant, consult the Pollock engineers about your ladles. They'll work with you to develop new highs in efficiency and safety.



385-ton capacity open hearth ladle built by Pollock is the world's largest. It stands 17'-3-½" tall.



100-ton capacity all-welded electric furnace ladle by Pollock. All-welded construction cuts ladle weight—increases payload.

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THE GUIDED MISSILE IS A VAST COMPLEXITY OF SYSTEMS FOR GUIDANCE, TELEMETERING, CONTROL, PROPULSION, ETC.

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Research and development people just like yours are proving every day that there *is* a *simpler* way! Constantly, technological improvements are being developed in your own laboratories as well as in laboratories of such organizations as Sciaky.

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for the
Brightest Season
of the Year

The special brightness of the holiday season is reflected in the shining faces of the many household servants made of Brass . . . honest, solid Brass that's a faithful lifelong friend on every job it's called upon to do . . . in a word, Brass that's made "Bristol-fashion." Prove it . . . *in your own product.*

The **BRISTOL BRASS** Corporation
Since 1850, makers of Brass strip, rod, and wire in
BRISTOL, CONNECTICUT

Steel company installs a P&H Hevi-Lift Hoist...

doubles pattern-storage capacity, saves cost of new warehouse

Before this Hevi-Lift® Hoist was purchased, storage was limited to the height a fork truck could reach. Space above lay idle. An adjoining building, needed for immediate production, had to accommodate overflow storage.

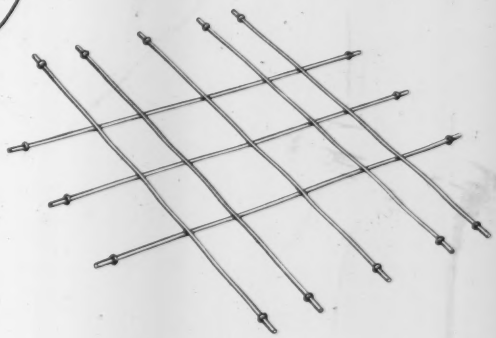
Now, the P&H Hevi-Lift enables the operator to lift patterns safely to any height, under complete control. A second deck, erected to utilize all the area between floor and ceiling, more than doubles storage capacity. Space in the adjoining building has been reclaimed for production facilities.

Hevi-Lifts prove profitable in many other ways on lifting jobs from 1,000 to 40,000 lbs. Bulletin H-5 tells you more. Write Dept. 205E, Harnischfeger Corp., Milwaukee 46, Wis.

HARNISCHFEGER

P&H ...quality and service for 74 years

KEYSTONE GALVANIZED COLD ROLLING QUALITY WIRE STUDY



KEYSTONE QUALITY ... Quirk DESIGN

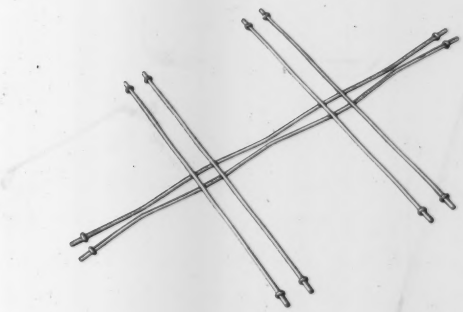
make the strongest milk crates ever built!

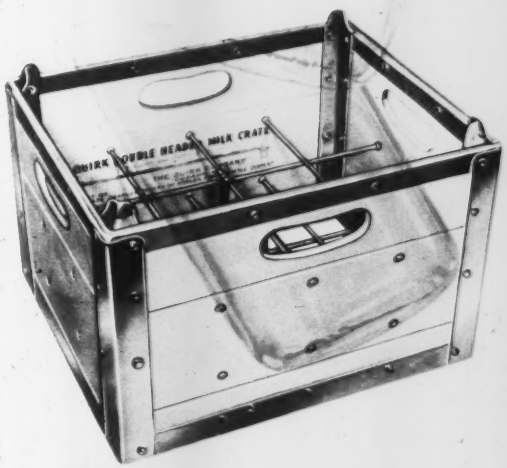
How important is wire in the manufacture of milk crates? "Plenty!" says Casson Butcher, General Manager, Quirk Manufacturing Company, Cudahy, Wis. Here's why Quirk uses Keystone Galvanized Cold Rolling Quality Wire 100%.

- Heading quality—Quirk Bottle Saver Crates use patented double headed rods to brace the crate and prevent loosening of the bottom, corner and side channels. Keystone Wire serves this purpose perfectly.
- Uniform, zinc coating must resist daily immersion in chemical baths at the dairies, yet adhere tightly and avoid flaking from the cold rolling operation. (Flattened wire gives the necessary smooth surface for paper carton crates.)
- Weldability—clean silver brite galvanized surface on specially developed analysis of homogenous steel produces strong uniform welds.
- Easy forming—Quirk Bottle Saver Crates require high protective wire loops with slight spring action. Keystone cold rolling quality wire has the correct temper and stiffness to properly form with ease, yet retain the spring required for rough handling.

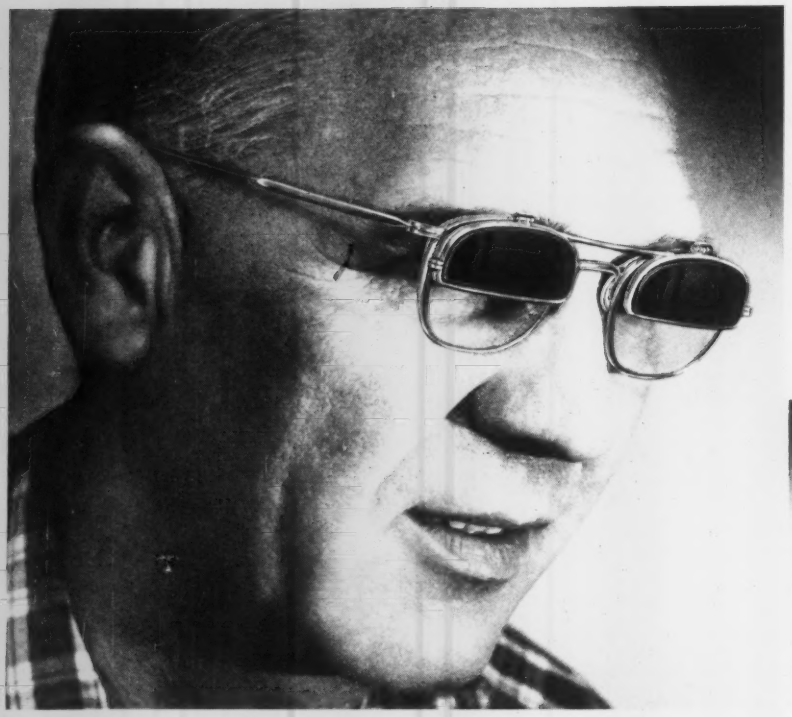
This is how another manufacturer builds a quality product —and Keystone Wire helps make it easier and more practical. It may be the answer to many of your quality control problems, too. For complete information, call your Keystone Representative. Our metallurgical staff is anxious to help solve your wire problems.

Keystone Steel & Wire Company, Peoria 7, Illinois





KEYSTONE WIRE FOR INDUSTRY



Eye Protection

SCS202
Lift-Front Goggles

Gives Vision "a Lift" on open Hearth Furnace Work and Welding Operations!

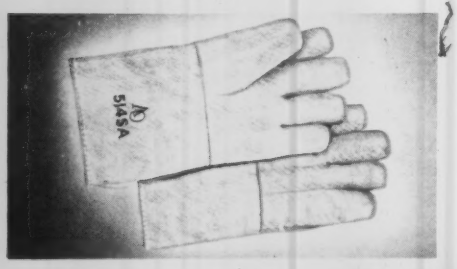
AO's NEW LIFT-FRONT ULTRASCOPIC SAFETY SPECTACLES

Here's a new AO-engineered spectacle-type safety goggle (SCS202) featuring a half-eye metal lift-front segment . . . in the popular new ultrascopic shape* . . . and hinged to the top of our F5100 frame. A specially developed friction joint permits the lift section to be raised and lowered repeatedly without loosening. The lift-front can be set in any position and will hold even after constant use.

The SCS202 is regularly fitted with clear, plano Super Armorplate lenses or with prescription lenses when needed.

The lift-front section is available with cobalt blue or Calobar lenses AND CAN UTILIZE A NEAR POINT SEGMENT FOR WELDERS WHO NEED CORRECTED VISION FOR OVERHEAD OR SHOULDER-HIGH WORK. This feature is especially practical for under-helmet protection — eliminates the need for spherical power plates which have to be changed manually when a change in vision range is needed. Your nearest AO Safety Products Representative can supply you.

*The AO F5100 Series features wider field of vision . . . double braced bridge and many advancements.



Also New! AO Silvabestos† Gloves

Abrasion tests show increased wear resistance up to 168 per cent over conventional asbestos gloves. Recommended for open hearth operations, heat treating, handling hot parts, etc.

NOTE: AO Sweatbands keep workers cool and comfortable . . . increase efficiency . . . prevent accidents due to blurred vision. Keep a supply of sweatbands on hand.

†Registered by Raybestos-Manhattan, Inc.

Always insist on AO Trademarked Safety Products

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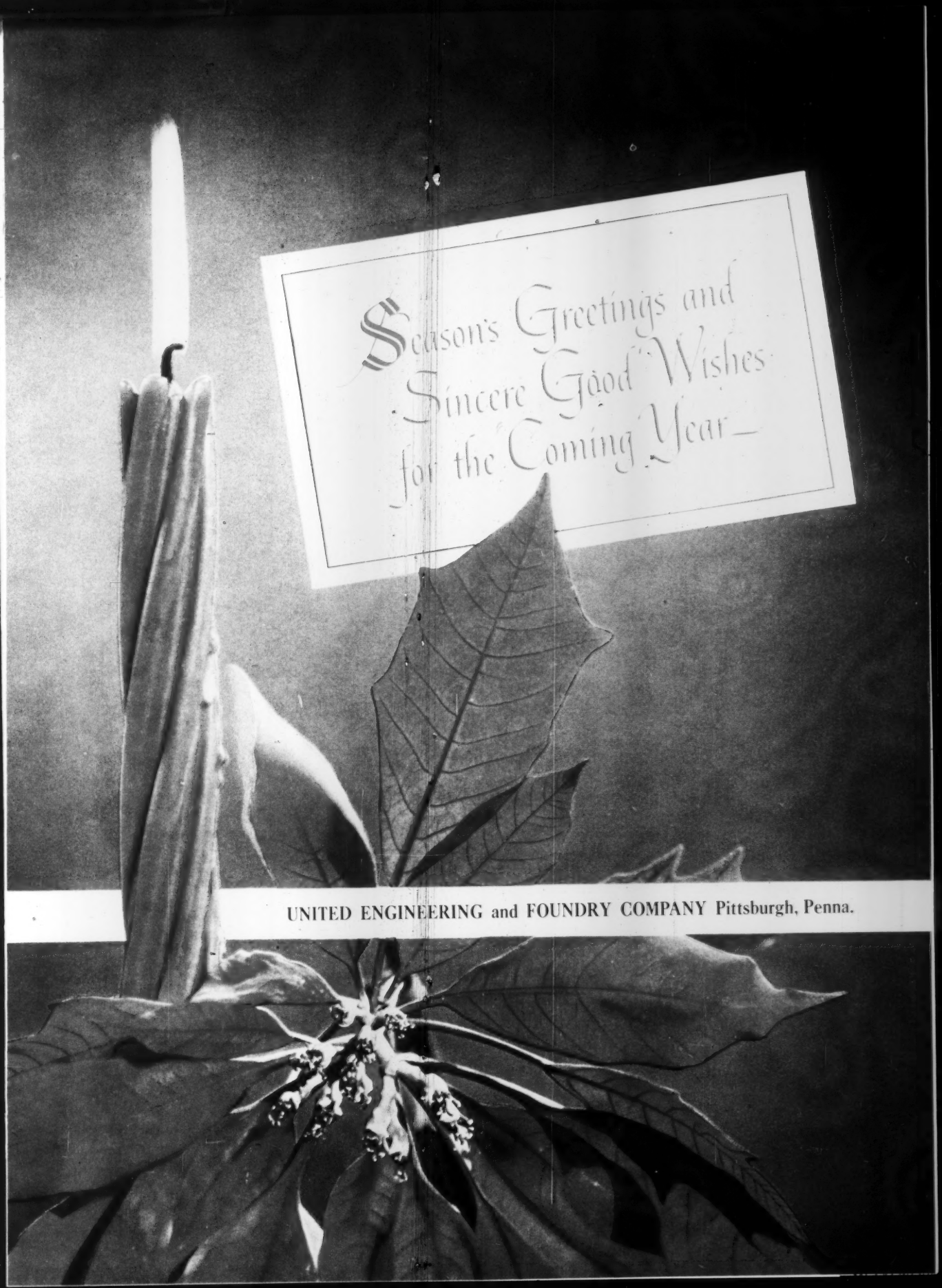
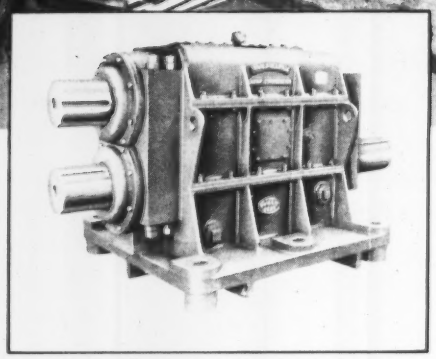


UNITED ENGINEERING and FOUNDRY COMPANY Pittsburgh, Penna.



Heavy Duty 18" Pinion Stand rated 3000 horsepower, at 150 rpm. input.

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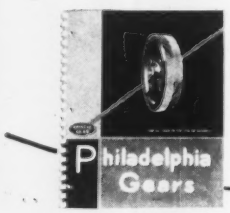
Mill Pinions and complete Pinion Stands by Phillie Gear have for many years given dependability plus long service life in the Steel Industry. Engineered Philadelphia Mill Pinions and Pinion Stands are available in even the largest sizes—with prompt deliveries and savings, both in installation costs and in reduced maintenance costs.

* GROUND TOOTH GEARING AVAILABLE

Phillie Gear can quote on your pinion stand requirements in either precision hobbed gearing, or now with ultra-precision hardened and ground tooth gearing. Our new tooth grinding equipment is opening new horizons in rolling mill performance. Write or phone for information.



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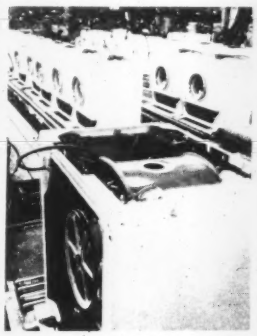
STEEL

Metalworking Outlook

December 15, 1958

Price Fighting Tempers Appliance Optimism



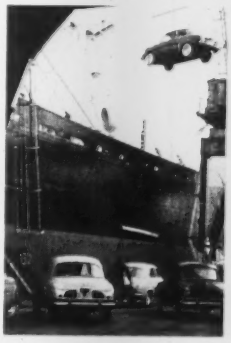
Appliance makers expect a 5 or 10 per cent increase in sales next year, but gloom-and-doom statements have rarely been so numerous (Page 83). Reason: The industry is racked with price fighting on the retail level. Even if you are not connected with the appliance business, take note of this classic example of the futility of price warfare. Thirty radio, television, and appliance manufacturers failed in the first ten months this year, 41 in all of 1957. Says one producer: "Chaotic pricing has damaged our integrity."

Metalworkers To Boost Capacity 2.6%

Despite the recession, managers tell us (Page 81) that metalworking will expand its capacity 2.6 per cent in 1959. Spending of U. S. firms for capital items will be at an annual rate of $30.5 billion next quarter, vs. $29.9 billion this quarter, and $32.4 billion in the first quarter of 1958. The great part of the money, of course, will go for the replacement of plant and equipment with more efficient facilities. While 2.6 per cent greater capacity doesn't sound outstanding, it is remarkable because of the number of below-capacity operations in 1958. (The steelmaking rate, for example, will average about 60 per cent.) Significance: We're on the threshold of the soaring sixties, and many firms will be getting ready in 1959. Are you?

World Competition Cuts U. S. Metalworking Export Gain

Rising competition for world trade will hold America's metalworking exports to a 2 per cent gain in 1959 while domestic sales will climb about 9 per cent. The explanation is the increasingly familiar one: We can no longer compete in world markets with many of our products. The French and German plans for world trade next year (Page 96) show they're underpricing us regularly, and their quality is good. Beginning Jan. 1, they'll join Belgium, Luxembourg, Holland, and Italy in the start of a new common market that will pose added competitive threats to U. S. goods.



$95 Billion in Modernization Needed

American industry has $95 billion worth of modernization to go, says E. J. Hanley, president of Allegheny Ludlum Steel Corp. He urged that the job

be started quickly to insure American prosperity and the improvement of our ability to compete in world trade. U. S. Steel Corp. Chairman Roger M. Blough warns that we "must face up to the probable fact" that we'll no longer maintain our predominant role in steel production or over-all industrial production because of the rapid inroads of world competition. Our proportion of world steel production dropped from 54 per cent in 1946 to less than 30 per cent in 1958.

Structural Aluminum Begins To Move

Look for aluminum to give steel competition in still another area—structurals (Page 179). Don't be fooled by the fact that aluminum structurals probably account for less than 5 per cent of all aluminum shipments. Potential uses are terrific—in bridges, electric utilities, transportation. Steel and other metal producers are studying the implications of yet another development in the light metal. Aluminum makers promise stable prices from now until June 30 (Page 202). One effect will be to squash what little chance remained for steel prices to be boosted at the turn of the year, via higher extra charges.

Good Bet: Steel Merger Case To Go to High Court

Look for Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. to appeal Federal Judge Edward Weinfeld's decision prohibiting their merger. A spokesman says: "We have nothing but time and money to lose by appealing." The Justice Department's first draft of the injunction against Bethlehem and Youngstown was not accepted by the court. It's being rewritten. When the injunction is signed, the companies have 60 days to appeal. The final high court ruling won't come until late 1959 or early 1960.

Patman, SBA Feud over Small Business Act Interpretation

Watch for a red-hot fight on small business to break out in the next Congress. Rep. Wright Patman (D., Tex.) and the Small Business Administration are already hurling charges and countercharges. The issue: SBA's interpretation of the last Congress' Small Business Act, particularly that part relating to investment groups (Page 90).

Wire Fabric Shipments To Hold

Deliveries of welded wire fabric in 1959 are expected to equal tonnages shipped in 1958. However, the industry still operates below capacity, which is probably about 900,000 tons a year. The Wire Reinforcement Institute

says the highway program has been slow to get underway, and its peak demands on the industry won't be felt until about 1960 when it will account for about one-third of the fabric industry's capacity.

Coal Output To Rise 13.8% Next Year

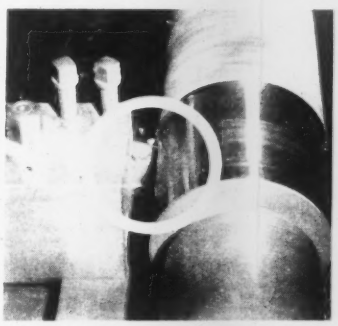
Watch for soft coal production in the U. S. to rise to 455 million tons in 1959, up 13.8 per cent from this year's output. The National Coal Association forecasts that coal consumption will increase 8.1 per cent (to equal production). In 1958 many consumers reduced their coal stockpiles and used more coal than was mined. NCA thinks utilities will take 7.1 per cent more coal in 1959 than they did in 1958; steel will use 36 per cent more; other industrial uses will gain 1.4 per cent. Coal prices will go up some to recover part of the higher wage costs that start Jan. 1, but producers will have to absorb a share of the increase.

How To Measure Your Managers' Performances

Do you have specific ways to measure how your managers are performing? Probably not, because bench marks have been hard to find. William C. Wichman, Hotpoint Co.'s general manager, attacks the problem by pinpointing the manager's accountability. Hotpoint's managers help set their own goals against which their performance is measured. (Page 86)

You Can Get More Out of Ceramic Tools

If you're still wondering how to take full advantage of the highly touted ceramic cutting tools, here's some help. A chamferlike land around the cutting edge is almost a must. Ceramics nearly always work better with a negative rake. Those are two of the conclusions based on a two-and-a-half year research project just completed. Despite fears that ceramics won't make roughing cuts, the study (Page 128) shows it can be done.



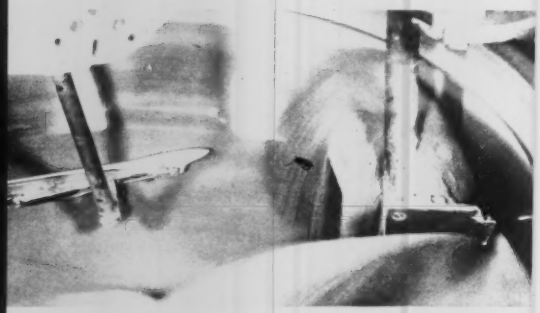
Cheap Atomic Power 15 Years Away

You'll have to wait at least 15 years before you can depend on nuclear reactors as a cheap power source. They still won't be able to compete in areas where hydroelectric power is available. Eight major prototype nuclear plants operate or are under construction in the U. S., producing power at costs ranging from 20 to 50 mills per kw-hr. Coal plant generation costs average 6 to 8 mills per kw-hr. Under development are nuclear superheaters

that will cut costs to 12 to 16 mills. Second-round plants, operating by 1970, will use improved fuel elements to cut costs still more, to 10 to 12 mills. Then, better technology will reduce the cost of fuel elements so nuclear reactors can be competitive with coal plants.

Prospects for Taxes

The next Congress is not likely to raise tax rates. But the U. S. needs more money, and lawmakers will try to get it by: Spreading the tax load wider among taxpayers; eliminating preferential tax devices; and broadening the income base on which taxes are levied. Those three routes are suggested by Rep. Wilbur D. Mills (D., Ark.) As chairman of the tax-writing Ways & Means Committee, he ought to know.



Loose Abrasives Give Fast Finish

Hand buffing is rapidly getting too expensive to use. Among ways to modernize finishing is one that involves immersing parts in fast moving slurries of loose abrasives. There are eight proprietary ways to approach it (Page 150). The slurry-abrasive method doesn't necessarily give a better job than hand polishing, but the quality is good, and it's much cheaper.

Job Outlook Brighter for June Grads

Job prospects for June college graduates are brightening. While companies are signing up for campus interviews at a pace 10 per cent behind last fall's, H. Glenn Ludlow, Michigan University's placement director, is confident the number of companies seeking graduates will equal or exceed the 1957-58 total. Last spring, many firms canceled or curtailed recruiting. No such cutback seems likely during 1959.

Rambler Capacity To Be Raised

American Motors Corp. will increase its manufacturing capacity to more than 400,000 units annually by the start of the 1960 model year. Present capacity is slightly more than 300,000. A $10 million program calls for no plant construction, but revamping of existing facilities at Milwaukee and Kenosha, Wis. As of Dec. 12, AMC had built 91,000 '59 Ramblers, compared with 44,000 '58s a year ago.

Straws in the Wind

Inland Steel Co. President Joseph L. Block predicts 1959 steel output at 110 million to 116 million ingot tons . . . Reynolds Metals Co. is introducing heavy end aluminum pipe for chemical, petroleum, and farming markets . . . License plates for California cars will be made of aluminum, instead of steel, beginning in 1963 . . . Joy Mfg. Co. is boosting prices 5 per cent on various types of mining equipment . . . The strike of 7000 at Chrysler Corp.'s Dodge Main plant caused layoffs of nearly another 20,000 last week.

ANOTHER RYERSON PLUS: Production-ready steel

"There's the front end of our production line . . . right on time"

Steel right off the truck—ready for your production line . . . your steel supply can be that simple when you rely on Ryerson. You order only the kind and quantity of steel you need—*as you need it*—and cut costs all along the line.

You reduce investment in equipment as well as materials. You save valuable storage space . . . reduce handling costs, scrap loss, taxes, etc. You gain complete flexibility of steel supply without long-term commitments . . . and assure a ready, steady flow of material to keep production stepping. You're never caught short . . . you're never overloaded.

Ryerson's size, facilities, staff and service *attitude* assure dependable delivery to meet regular schedules or to handle special short-run orders. Whatever you need, this unsurpassed source of Certified Quality steel is at your finger tips. Phone your nearby Ryerson plant today.

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Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

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How Bright Wire Fabricators Save and Make Money with DSC-Portsmouth Long Production Run

LPR COILS

One user summed up LPR advantages this way. "One big run on your LPR coils and we suddenly discovered after all our wire-working years, we had been using teacups instead of buckets for baling out our leaky production boat!"

WHAT OTHER TYPICAL USERS REPORT—

"We cut our unloading time in half."
"We reduced our coil storage space 15%."
"We quit using small-coil storage racks."
"Our man-hour costs dropped 20%."
"No more returnable gimmicks for us."
"We cut our scrap losses by 90%."
"In our cutting, straightening and flattening department, one operator now runs four machines. Best previously, three machines."

See how compactly you can stack over 13 tons of LPR coils

LPR
BRIGHT WIRE COILS

GAUGES

Low and Medium Carbon
.072" .500" inc.
High Carbon—.080" .250" inc.

COIL WEIGHTS

Up to about 4000 lbs. except
L. & M. C. .0475" to .062"
made in 1000 lb. coils

PERFORMANCE-PROVED PRODUCTION MATERIAL PLUS A SELF-CONTAINED COST REDUCTION SYSTEM

That describes DSC Bright Wire in LPR coils. **How about exploring the possibilities in your own operations?** Just call your nearest DSC "Rep" or write us at Detroit. Either way, your inquiry will get immediate action . . . whether your interest is Bright Wire or other DSC products and services. Hear from you . . . soon?

Happy Holidays and a Big New Year for All

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

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The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric

© DSC 1958

Should Top Brass Help Sell?

One of our favorite metalworking presidents heads up a successful, multi-million dollar company with a well-organized and well-managed sales organization.

He could sit back in his big, soft chair and press buttons to get endless reports from research, engineering, production, marketing, and sales as the bases for guiding his company's destiny.

But he doesn't. Sure, he gets reports, but he also gets out of his big, soft chair and into the field. He contacts customers and prospects with the No. 1 objective of getting more business for his company.

He does not travel so he can live off a fat expense account, or take over work that should be done by the sales department.

He does it for two reasons:

1. To cultivate and maintain top-level contacts that are not readily accessible to his sales people.

2. To get first-hand facts as the bases for making better decisions for the company.

Here are some of the many collateral benefits from his work in the field:

It helps him find out personally whether his company's products are being well received, whether changing trends call for new or improved products, whether more research and plant capacity are needed.

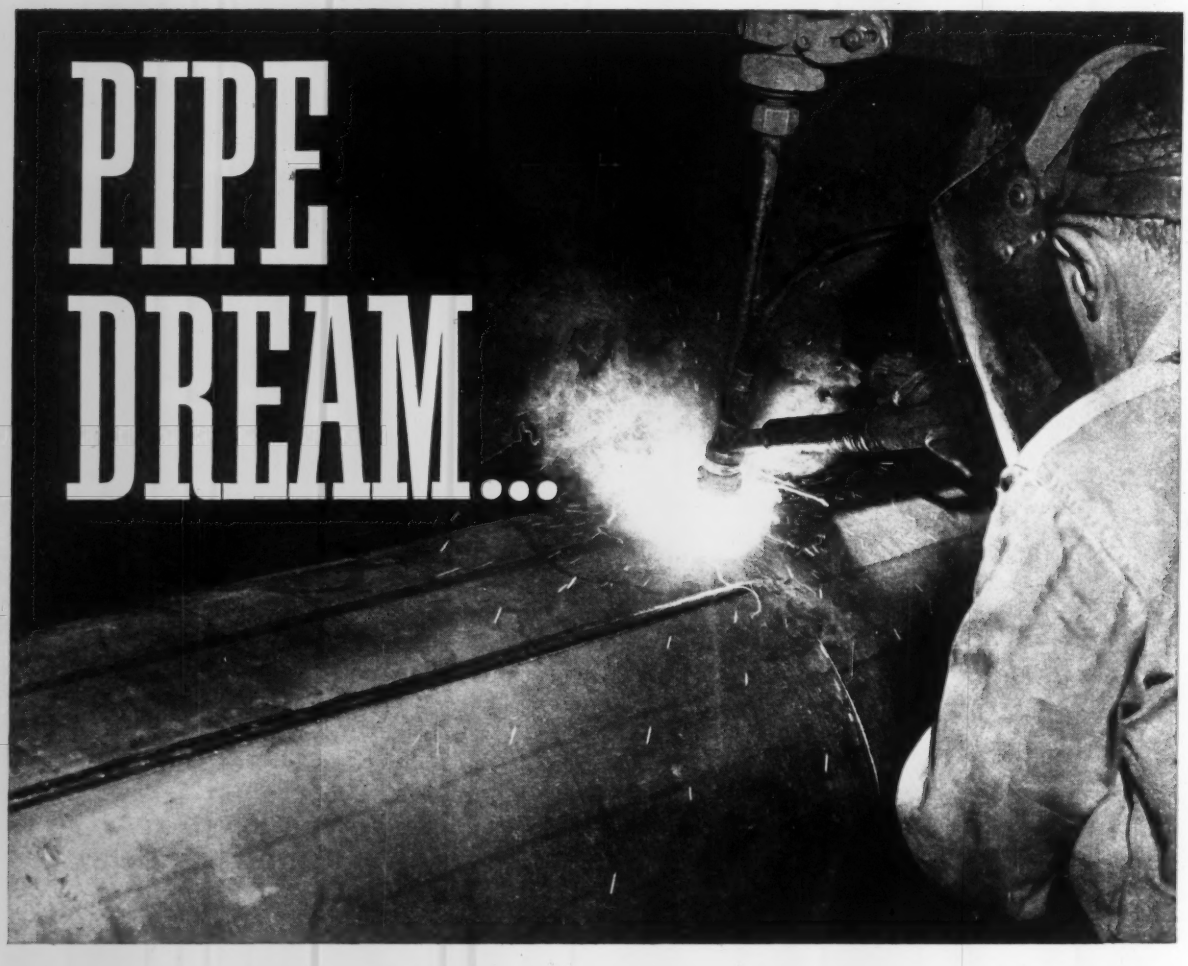
It helps to build morale of the sales organization since better customer relations at the top make it easier for salesmen to get orders.

It helps build his own morale and make him a better executive. Unlike many sit-at-home executives who are softened by prosperity and often shielded from the facts, he does not lose his perspective—or get lonesome! He can decisively appraise the recommendations of his associates and hold his ground in a board meeting.

We think that top brass should sell the way our friend does.

Damon H. Such

EDITOR-IN-CHIEF



...UNIONARC Welding saves $7000 on one production run

UNIONARC Welding—LINDE's new electric welding method for steel—increased production by 300% and saved a western pipe mill $7000 on a single run of steel pipe. Replacing covered electrode methods, UNIONARC Welding is expected to save this company $150,000 a year.

UNIONARC Welding uses a continuously-fed wire electrode, magnetically coated with flux and shielded with carbon dioxide gas. It has three times the speed and weld penetration of covered electrode welding. And UNIONARC Welding gives you "finished", X-ray quality welds and low hydrogen deposits—in all welding positions.

See for yourself—ask your nearest LINDE representative to *prove* that UNIONARC Welding slashes time and labor costs over conventional methods. Call your local LINDE office today! Or write Box ST 123, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.

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TRADE-MARK

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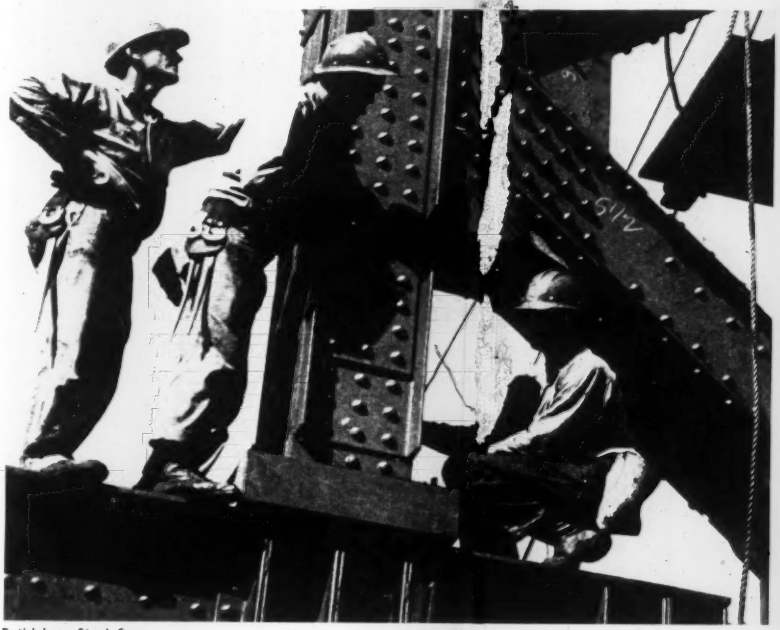
37.1% of Metalworking Plants Will Expand in '59



Bethlehem Steel Corp.

Of those:

9.5% Will Build New Plants

34.5% Will Build Additions

70.1% Will Buy Equipment

Metalworking Will Up Capacity 2.6%

PRODUCTION CAPACITY of U. S. metalworking plants will be hiked 2.6 per cent next year—despite a lot of excess space and equipment in many industries now. Reason: Alert managers are preparing for the "soaring sixties." In some places outside metalworking, the upswing is already getting underway (see table on next page).

STEEL asked the general managers of 7500 metalworking plants for their 1959 expansion plans. Answer: Nearly 4 of 10 will take on new capacity.

• **Paradox**—The steel industry is operating at 75.5 per cent of capacity this week and will average only about 60 for the year; the aluminum industry is producing at about 85 per cent of capacity. Yet 38.2 per cent of the primary metals plants will expand in 1959. The machine tool industry is operating under 40 per cent of capacity, and its prospects for next year aren't much better. But the machinery (except electrical) group, in which machine tools are a major factor, will boost its capacity 2.2 per cent next year, the survey reveals.

Seasoned industry observers have a logical explanation for the paradox. They believe that metalworking management has taken a good look at long range prospects, and the future appears to be so good that they want to get ready before orders start pouring in.

• **Doldrums**—But the survey results don't signal an expansion boom—far from it. Metalworking planned to hoist capacity about 3.5 per cent this year and nearly 5.6 per cent in 1957. Few metalworking industries will equal their 1958 expansion rates; many will fall far below that level. For example, electrical machinery producers plan a 3.2 per cent increase in 1959, vs. about 6 per cent this year.

• **Bright Side**—Figures on total 1959 spending for plant and equipment (including purchases for replacement) make more pleasant reading. Industry's campaign to lower production costs is contributing to the upswing found by the

In Capital Spending, a Slow Turn Upward

(Billions of dollars, seasonally adjusted annual rates)

	1959 Jan.-Mar.*	Oct.-Dec.*	1958 Jan.-Mar.	Year
Manufacturing	11.06	10.79	13.20	11.50
Durable goods industries	5.35	5.11	6.58	5.54
Primary iron & steel	1.01	1.01	1.52	1.22
Primary nonferrous metals	0.34	0.30	0.68	0.43
Electrical machinery & equipment	0.42	0.40	0.52	0.45
Machinery, except electrical	0.85	0.90	1.11	0.95
Motor vehicles & equipment	0.55	0.52	0.66	0.58
Transportation equipment, except motor vehicles	0.37	0.32	0.43	0.36
Nondurable goods industries	5.71	5.68	6.62	5.96
Mining	0.84	0.91	1.00	0.93
Railroads	0.54	0.59	1.02	0.76
Transportation, other than rail	1.72	1.64	1.69	1.51
Public utilities	6.41	6.32	5.87	6.11
Commercial & other	9.94	9.68	9.63	9.74
Totals	30.51	29.93	32.41	30.53

Source: Department of Commerce, Securities & Exchange Commission.
*Estimated.

Securities & Exchange Commission and the Department of Commerce in their latest survey. It indicates that American industry will invest in plant and equipment at a $30.51 billion annual rate during 1959's first quarter. That compares with a $29.93 billion rate during the current quarter.

• **Lag by Comparison**—But the estimate for 1959's first period is nearly 6 per cent below the rate in the first quarter of this year and slightly below the 1958 average. That puts it 17 per cent below the record set in 1957. Manufacturing industries accounted for the bulk of the decline.

• **Who'll Spend Most**—Public utilities continue to be the strong point; their first quarter (1959) spending will be 5 per cent above the 1958 rate. Nonrail transportation and commercial organizations are showing significant gains. The nondurable goods industries will boost their outlays slightly, predicts the SEC-Commerce survey.

• **Metalworking's Plans**—The durable goods industries will spend 4.7 per cent more next quarter than they did during the current period. But that will be nearly 20 per cent below the rate during the first quarter of this year.

Primary producers of nonferrous metals will spend only half as much during next year's first period as they did in the first three months of this year. Nonelectrical machinery makers will spend 23 per cent less, and the primary steel and iron group will register a 34 per cent drop.

Here's a comparison of annual rates for the durable goods industries:

1958	$5.54 billion
1957	$8.02 billion
1956	$7.62 billion

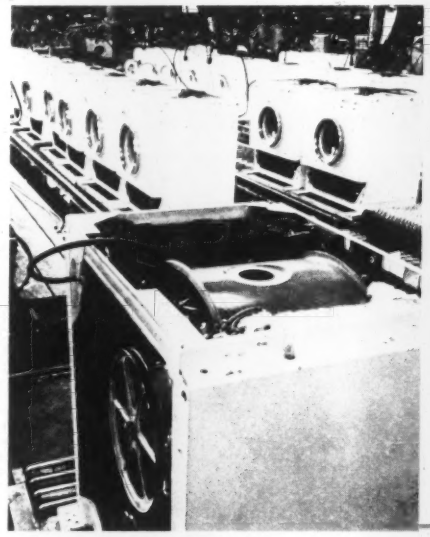
The durable goods industries hit bottom in the second half of this year. All categories, except nonelectrical machinery, will spend more next quarter than this quarter (see table).

• **Wrapup**—Both STEEL's survey and the SEC-Commerce Department forecast indicate these three things: 1. The rate of plant and equipment investment is at the threshold of a lengthy uptrend. 2. The upswing will start slowly but gather speed during the second half of next year. 3. Alert management is not waiting for near capacity operations before loosening its purse strings. Rather, it is adopting a policy of long range preparedness. Metalworking will be ready for the boom years.

Mobiles To Get Appliances

Philco Corp., Philadelphia, has started manufacture of appliances for the mobile home industry. John L. Utz, general manager of special market planning, heads the department handling this activity. Products installed in mobile homes will have the same warranties as those used in conventional homes.

Factory Shipments of Electric Appliances



	(UNITS)		
	1959	1958	1957
Air Conditioners	1,856,000	1,600,000	1,750,000
Automatic & Semi-Automatic Washers	2,800,000	2,650,000	2,782,000
Dishwashers	428,600	386,100	390,000
Electric Dryers	900,000	800,000	881,000
Home Freezers	1,077,500	1,036,000	925,000
Ironers	25,000	30,000	44,000
Ranges (including built-ins)	1,265,000	1,183,000	1,385,000
Refrigerators	3,412,000	3,075,000	3,350,000
Washer-Dryers	200,000	168,000	179,000
Wringer Washers	800,000	850,000	903,000

1957 statistics from manufacturers' associations. STEEL's estimates for 1958 and 1959 are based on interviews with manufacturers and associations.

Appliance Makers See 5-10% Upturn

THE MAJOR APPLIANCE industry is approaching 1959 with cautious optimism. Industry leaders anticipate a 5 to 10 per cent increase over 1958 sales. Some companies are shooting for over-all gains of as much as 35 per cent. Goals for specific lines are up as much as 50 per cent.

Price cutting and low profit margins worry appliance executives as much as unit sales. "Chaotic pricing has damaged our integrity as an industry in the customer's eyes," says a sales promotion manager. Judson S. Sayre, president, Norge Div., Borg-Warner Corp., Chicago, asks: "With the stimulating upturn in business, will companies rush into more production to get a larger share of the market, and produce, through intemperate overproduction, more inventory gluts, more price dumps and frenzied selling, new consumer confusion, and, again, a self-induced business recession?"

• **Profits Slim**—Price cutting has nipped profits. "What good does it do to sell a million appliances if you can't make a profit on them?" ponders a retailer. Discounting, up to 25 per cent off list, is slashing profits at all levels of distribution, particularly at the retail level. The National Appliance & Radio-TV Dealers Association reports dealers operated on a 1.6 per cent investment return last year. They don't believe '58 will be much better.

There has never been such a wide gap between our capacity to produce and our willingness and ability to sell creatively, admits H. L. Travis, vice president-sales, Kelvinator Div., American Motors Corp. "Unless we can successfully combat price cutting so that everyone in the picture can make a fair profit and return on his investment, we will have to change our way of doing business," declares another industry spokesman.

Dun & Bradstreet lists 30 failures among radio, TV, and appliance manufacturers during the first ten months of this year (liabilities totaled $3,546,000). There were 41 failures in all of 1957 (liabilities, $8,511,000).

• **Sales Outlook**—Since the appliance upturn started in July, refrigerators, freezers, laundry equipment, and some ranges have been doing well. Still disappointing among the more popular items are clothes dryers, food waste disposers, and dishwashers.

Fred Maytag II, president, Maytag Co., Newton, Iowa, says: "We have seen a temporary setback to the appliance industry. Our recession has definitely bottomed out, and sales are moving upward."

Market saturation is over 85 per cent for radios, refrigerators, TV, all ranges (electric ranges: 31.5 per cent), and washers. New modes of living (increased use of frozen foods, for example) and changing con-

sumer wants (larger, more versatile units, portable TV) should boost the replacement market. Saturation of less than 20 per cent for air conditioners, clothes dryers, disposals, freezers, and water heaters points up a great sales potential.

Expectations that 1959 will top a boom year like 1955 are mixed. Only air conditioning producers predict a big jump over that year (220 per cent, says one maker). Another bright spot will be home laundry appliances, which the American Home Laundry Manufacturers' Association says will have their third best year in history (exceeded by 1956 and 1955).

• **Trade-ins**—An increasing number of firms are promoting trade-ins as a selling tool. "Used appliances are destined to become an American tradition as used cars are today," states D. C. Bowell, head of used product merchandising, Frigidaire Div. of General Motors Corp. "There was no recession in reconditioned used appliances," he continues. "Frigidaire dealers equipped to handle reconditioned appliance sales could not get enough used products to supply demand." Many in the industry recognize the increasing importance of used appliances but question their potential as a major market factor.

• **Built-ins** — Built-in appliances have held up well in the depressed market. Sales of electric ranges are up about 20 per cent, refrigerators perhaps as much as 25 per cent. One major producer reports sales in this category totaled 31 per cent of production last year and expects the figure to reach 38 per cent this year. Other equipment of this type has not snared a significant portion of the market.

The increasingly popular practice of including major appliances in new homes (1.2 million will be built in 1959) has brightened the future of built-ins. Some will also be furnished with free standing appliances.

• **Color** — Color appliances have not caught on as well as anticipated. They are sliding along at about 5 per cent of the market. But the built-in boom is a boon to color. The adaptation of built-in appliances to cabinet colors in a kitchen is easier than it is with free standing appliances where the match is a more serious problem. It is generally agreed that color will gain substantially in the next few years.

• **Prices**—Few manufacturers plan price increases next year. But increased excise taxes will result in some hikes. (Not all makers will absorb them.)

The over-all appliance picture was not as bad this year as factory shipments may indicate. Producers went into 1958 with heavy inventories and production geared for a 10 per cent increase over the 1957 performance. Anticipated sales did not develop, and manufacturers' inventories kept dealer stocks adequate. Result: Reduced work at plants.

• **Gas**—The gas industry is preparing to battle with the electric industry for the home appliance field. The Gas Appliance Manufacturers Association has tripled its ad budget. It will spend a record $30 million for advertising and promotion next year.

The gas refrigerator, once thought dead, is on the rebound. All-gas kitchens are being pushed. Even plug-in gas cooking burners, percolators, air conditioners, freezers, frying pans, and casseroles are in the works.

AN ULTRASONIC SEAMWELDER, being developed by Westinghouse Electric Corp., is shown completing a weld between two 10-mil thick aluminum straps. The aluminum sheets pass through two wheels vibrating at 20,000 cps. The oxide coating is broken and the metal lattices on the surfaces weld themselves by a kneading action

Chamber Experts See Moderate '59

THE ANNUAL forecasting session of the U. S. Chamber of Commerce last week was pretty tame. The chamber's panelists took a moderate view of 1959.

• **GNP** — Gross national product, predicted Dr. Emerson Schmidt, the chamber's director of economic research, will rise about 5 per cent, to $470 billion-$480 billion.

• **Capital Spending**—"It is difficult to attain full prosperity without a strong capital goods boom," noted Dr. Schmidt. With the exception of William Dooly of Associated General Contractors, no one predicted much of an upturn (see Page 81). Planning for new projects will expand the last half of the year to hold industrial construction to within 10 per cent of this year's $2.5 billion, he said.

• **Housing**—This category remains questionable because of the possibility of tighter credit and higher interest rates next year. Mr. Dooly projects housing starts at better than 1.8 million, with apartments continuing to add strength to the private construction category.

• **Autos**—Harlan Hadley, Automobile Manufacturers Association, forecast that 5.5 million cars will be made in the next calendar year.

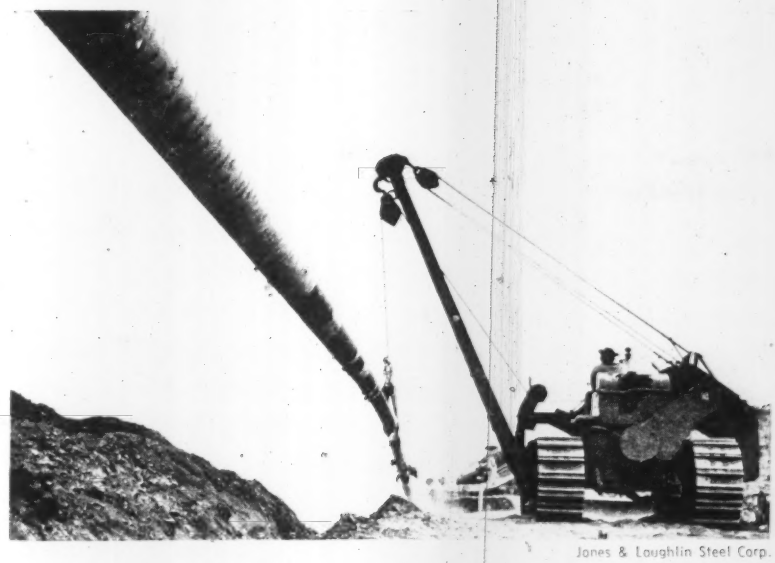
• **Durables**—George Eaton, executive vice president, National Tool & Die Manufacturers, sees few model changes next year in consumer durables, including autos and appliances.

• **Tool & Die Shops**—For his own industry, Mr. Eaton foresaw a 15 per cent hike in 1959, which would still be "depressed." Such a gain would leave it 15 per cent away from 1957's level, which he called only a "reasonably good year."

• **Steel**—Pessimists put steel production at 105 million tons next year; optimists go as high as 120 million tons, said William Story of the Institute of Scrap Iron & Steel.

• **Railroads**—Railroads can be expected to come into the market after their "bleak" orders of 1958.

All panelists agreed prices will rise next year—but not too much.



Jones & Laughlin Steel Corp.

What Memphis Case Means

Reversal of the decision by the Supreme Court may encourage expansion of natural gas pipelines. Upturn in line pipe orders and gas drilling equipment predicted for 1959

IN REVERSING the Memphis decision last week, the Supreme Court gave steelmakers a big Christmas present and assured them a happier new year.

They can count on a resurgence of line pipe demand in 1959 as natural gas companies resume expansion programs that were shelved 13 months ago.

"Our shipments will probably jump 25 per cent next year," says a line pipe producer. A valve manufacturer predicts a 15 per cent gain in bookings and a 10 per cent spurt in shipments. Plate mills think the court's decision may mean a million tons to them soon.

• **How Trouble Began**—In November, 1957, a lower court threw the natural gas industry for a loss by ruling that transmission companies couldn't raise their rates without first obtaining the consent of all their customers. (Previously, they had been required only to give users six months' notice. Increases were subject to review by the Federal Power Commission.)

Although demand for gas was great, pipeline people lost much of their zest for expansion. Under the new rules, they'd sometimes find that one city of five they served would block an increase after the others had approved it. Banks decided pipelines were a poor risk. Results: At least four companies dropped plans for $222 million of construction. Three steelmakers had 250,000 tons of line pipe wiped off their books. Rockwell Mfg. Co., Pittsburgh, lost half its backlog of valves and meters.

• **Shipments Plummet**—The combined forces of law and recession have pulled line pipe shipments down from last year's record high of 4.2 million tons to this year's 2.6 million (estimated). The outlook for 1959 is encouraging, but few producers think more than half the lost ground will be recovered. A 3.4-million-ton year would be better than the average since 1949 (3.2 million).

In commenting on the decision, E. B. Germany, president of Lone Star Steel Co., said the Supreme Court's action should result in increased demand for line pipe and oil country goods and "rejuvenate" the whole natural gas industry. The full impact of the decision may be delayed until transmission companies obtain new financing for their postponed or canceled projects, he added.

Although Republic Steel Corp. believes reversal of the Memphis decision will stimulate new pipeline projects, it expects no immediate benefits. Its Gadsden, Ala., mill is running at capacity on large diameter pipe and has a big backlog. Speaking for A. O. Smith Corp., Milwaukee, H. F. Detrick, vice president, declares: "We fully expect that our line pipe business will be significantly better in 1959 than it was in 1958." Inland Steel Co foresees "materially increased demand" for plates.

• **Oil Country Pickup?**—Manufacturers of drill pipe, tubing, and casing hope the revival of interest in pipeline programs will mean better business for them, too. They believe gas producers will have to drill more wells to supply their expanding markets. Drillers' inventories of the popular sizes of tubing and casing are thought to be abnormally low.

Some steel executives think (off the record) that some market observers have exaggerated the significance of the Memphis decision. By way of illustration, one mill reveals that it lost about 150,000 tons of line pipe right after the decision was announced. "But six months later, one of the companies that had canceled gave us an order for 100,000 tons," says a sales official.

Line pipe producers don't think any expansion program that's started from scratch will help them much in 1959. They point out that the preliminaries (negotiating loans, obtaining a gas supply, procuring pipe, and acquiring rights of way) require at least six months.

• **Psychological Impact** — If the Memphis decision's reversal has any immediate effect, it will be to confirm buying intentions of pipe users. They'll issue releases against orders that were previously regarded as conditional. What's more, they'll release tonnage unrelated to the Memphis case that was being held up by their pessimism.

How fast line pipe bookings improve will depend largely on the FPC's diligence in processing a huge backlog of rate cases.

GE's Eight Key Result Areas

1. Profitability

It is the ultimate measure, normally considered on residual income (net income less a capital charge) and return on investment.

2. Market Position

It reflects not only share of market but compares one field with another—as gas, vs. electric.

3. Productivity

It measures efficiency of human, capital, and material resources.

4. Product Leadership

This is the key measurement. It compares quality with that of competitive products. Timing of new products and product improvements also counts.

5. Personnel

This measurement includes projections of management demands and the supply of promotable people.

6. Employee Attitude

It is measurable to a degree by attitude surveys and individual productivity.

7. Public Responsibility

This factor is concerned with the public's expectations of corporate performance.

8. Balance Between Short and Long Range Goals

The objective is to evaluate the effect of today's decisions on tomorrow's activities.

Here's a Way To Measure

HOTPOINT CO. gages its managers by comparing actual with planned performance. Two valuable functions are served: 1. An individual's development is analyzed and implemented. 2. Current activities are adjusted to established goals.

• **Foundation**—The key to the program is the management philosophy of William C. Wichman, Hotpoint's general manager and a vice president of General Electric Co., the parent firm. "Measuring," he emphasizes, "means more than historical analysis. It implies doing something about that analysis."

The basic objective of the program is to get each manager to enter his goals and accomplishments on an accountability sheet, so that he and his boss can periodically discuss his total performance.

• **Method** — GE has established "Eight Key Result Areas" (see exhibit) to measure the performance and trends of its diversified organization. Those areas are the framework for Hotpoint's appraisal program.

GE's chairman, Ralph Cordiner, stresses that decentralization requires measurement of managers' performance. A man is rewarded for a good record, displaced if he has a poor one.

The two major factors in Hotpoint's approach are:

• **1. Setting Individual Goals**—The man must thoroughly know the organization's goals, the business climate, and any specific situations affecting the company, Mr. Wichman explains. When the manager and the man (who may also be a manager) agree on the characteristics and needs of the situation, they can jointly set goals for the man's particular position. The manager will know—because it's his job—that the goals are in harmony with those of other members of the organizations.

• **2. Delegation and Acceptance**—Once the goals are determined, the man and his superior discuss the authority, facilities, manpower, and time required to attain the needed results, determine how they will be measured, and define the manner and timing of reports. For the superior, it means releasing authority. For the man, it means accepting accountability.

These "man-manager" relationships are developed at every management level, says Mr. Wichman. When framing his position guide, each man writes down his specific goals in each of the result areas. To do this, he makes assumptions about the situation, the resources he'll

Hotpoint's William Wichman talks of ways to judge a manager

Executive Ability

need, and his relationships with others (where team effort is involved).

• **Teamwork**—In team assignments, the man and his superior agree on how to measure the man's contribution to the project. Leadership in a team effort may shift. Take, for example, a project involving a design change and internal substitution of a less costly component. The team may include men from advance engineering, design engineering, manufacturing engineering, product planning, and accounting. Initial leadership may rest with the advance engineer, then shift to the design engineer, and so on as the project progresses.

• **Reports** — Periodically, the man reports to his superior and compares his results with standards, goals, or budgets. Deviations are explained, and goals and plans may be modified. The man makes two kinds of measurements in his report:

1. Primary—information directly affecting his accountability. Example: A salesman's primary measurement will probably relate to market position, volume attained, vs. potential, and the cost of getting that volume.

2. Secondary and personal—measurements the individual makes to help himself do a better job. The salesman might want to discuss with his superior the number of calls he makes per day, time spent per call, or contacts in a customer's organization.

Stresses Mr. Wichman: All managers must see that individual plans and goals combine to produce balanced results in the eight key areas.

• **How You Can Do It**—Mr. Wichman suggests this procedure to help you bridge the gap between operational measurements and appraisal of individual performance:

• **One** — Consider your business right now—it has certain potentials based on the state of your facilities, designs, products, organization. To get the best possible performance:

Analyze short range opportunities in relation to available business, competition, costs, prices.

Establish an integrated set of plans supported by budgets that are geared to improve performance in the business climate.

Set up a budget and measurement structure that permits operational measurements to f i l t e r d o w n through the organization so that they will ultimately apply to a minimum number of people.

• **Two**—Think of improving your business as separate from running it as it now exists.

Separated to a practical degree, improvement programs can be considered at will in the short range. The risk and potential of each project must be evaluated and aggressively followed in terms of its budget of time, cost, and results.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

More Americans Go West

Looking for growing areas? If so, turn to the West.

The Commerce Department reports six of the nation's ten fastest growing states are in that section. Three are in the South and one in the North Central States.

The westward trend has resulted in a 29.7 per cent increase in population of western states since 1950, from 19.6 million to 25.4 million. Nevada's growth has been 67 per cent, Arizona's 52 per cent.

The South registered the greatest total gain—an increase of 6.6 million in eight years, or 14.1 per cent. Florida gained 60 per cent.

Other areas are sharing in the nation's dynamic expansion. The North Central States have gained 14.7 per cent—6,548,000 more people. The Northeast States added 3.6 million, an advance of 9 per cent.

Executive Pay Static

Reduced bonuses have offset normal salary increases, shows AMA Survey of 3500 Companies

THE AVERAGE top executive made no gains in total compensation last year, says the American Management Association which surveyed more than 3500 companies in the U. S. and Canada.

Base salaries accounted for 80 per cent of compensation, bonuses 14 per cent, and retirement programs 6 per cent. About 35 per cent of the reporting companies had supplementary forms of compensation, such as stock options and stock purchase plans. Coverage: Some 65 per cent of the large companies and 12 per cent of small companies.

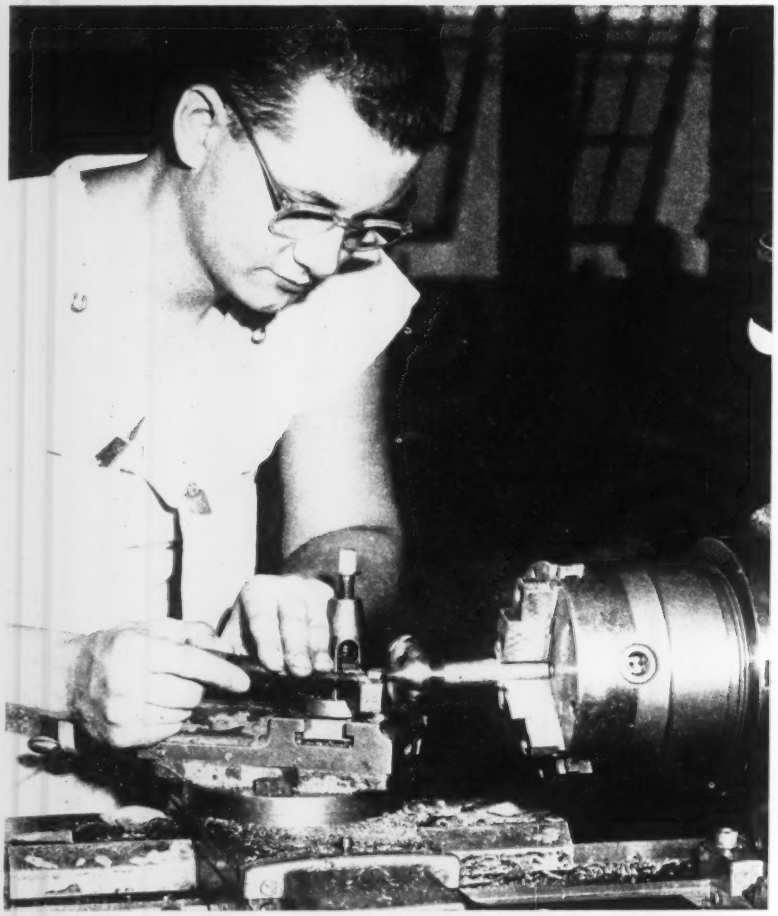
• **Lower Bonus Payments** — The survey disclosed that normal salary increases were offset by lower bonus payments, even though the management task was more difficult in a recession year. Bonuses varied more directly with profits than did base salaries. Bonuses were down to 36 per cent of base salary, compared with 45 per cent in more profitable years.

Sales and revenues shown by the survey were generally favorable, although the rate of increase was about one-fourth lower than the previous year and in many cases did not carry over into profits. Seven out of ten companies reported sales increases, but only half had profit increases.

Steel Payroll Up

Employment and total payroll of employees engaged in producing and marketing steel increased during October, says the American Iron & Steel Institute. Hourly and salaried combined payroll in 94.9 per cent of the industry rose from $294,277,422 in September to $325,307,323 in October, a gain of about $32 million. The October, 1957, total was $330,029,828.

Totals for the first ten months of 1958: Employment, 519,105; payroll, $2,736,445; average hourly wage, $3.155 (with an additional 33 cents in fringe benefits) average workweek, 34.9 hours.



OCDM Saves Tool Reserve?

A NEW program for using National Industrial Equipment Reserve machine tools in schools may go a long way toward solving Uncle Sam's tool problems.

Anticipating a Congress prone to save money in inconspicuous places, the Office of Civil & Defense Mobilization has moved to prevent a recurrence of last session's battle over funds for the National Industrial Equipment Reserve (NIER).

• **New Loan Program**—A year of quiet pressure by OCDM paid off last week in the form of an order from the Defense Department to loan 61 machine tools from NIER to the North Carolina Board of Education. (They're for the Forsyth County Industrial Education Center at Winston-Salem.) It was determined that the institution could not have obtained the tools through the Health, Education & Welfare Department's program for disposing of surplus tools to schools. (NIER tools are not surplus by any means; they will form the backbone of any mobilization effort needed to meet an emergency.)

The loan program is limited to this one instance until "the bugs are worked out," says an OCDM official. He guesses a year will be needed to see if the plan is work-

able; then more loans can be expected from the NIER.

• **Special Criteria** — The program must meet requirements of P.L. 883 passed in 1958: 1. Tool loans will "contribute materially to national defense." 2. The tools will be "properly maintained" and returned to the government without cost.

Applicants for tools have to be a "nonprofit educational institution" and must show that funds are available for financing shipping costs, equipment installation, instructors' salaries, power, heat, light, equipment maintenance, supplies, "and all other expenses involved." Instructors must be qualified, and the tools must be returned on request. Government inspectors will probably check the tools semiannually to see if they are being maintained and used correctly.

• **Accomplishment** — The program cuts down NIER storage costs, gets them maintained free of charge, puts them to constructive use, and disperses them, sums up the OCDM official.

NIER tools are now in two warehouses, one in a prime eastern target area. Plans for their dispersal to four or five sites are in the works, but the school loan program does that job even better.

OCDM is a little concerned about being swamped with applications for NIER tools, so the agency emphasizes the program conflicts in no way with the donation plan of the Health, Education & Welfare Department—in fact, it is probably better because the schools don't face the prospect of having the tools recalled by Uncle Sam.

The Winston-Salem school was picked for the pilot loan because training is needed in the area: A missile plant there reported its expansion has been held back because of a shortage of skilled workers.

Display To Tour Nation

A mobile display, designed to show businessmen, engineers, and industrial production supervisors a variety of motors and drive products in operation, will go on an 18-month nationwide tour starting this month.

The unit is a promotion of Reliance Electric & Engineering Co., Cleveland.

Ohio May Get SUB

Ohio Supreme Court "sighted SUB, sank same." New law to permit payment of Supplemental Unemployment Benefits may be proposed when the Ohio legislature convenes Jan. 5

ODDS ARE that Ohio's legislature will allow laid-off workers to collect Supplemental Unemployment Benefits. An amendment to the state law may come this session. Expansion of state jobless pay may also be an issue.

The Ohio Supreme Court's decision against simultaneous payments of SUB to people collecting unemployment compensation affects more than 200,000 workers covered by union negotiated SUB programs in the steel, automotive, rubber, glass, and other industries in Ohio.

• **Test Case**—The issue was carried to the Supreme Court in a friendly "test case" brought by the United Steelworkers against U. S. Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., and Youngstown Sheet & Tube Co. James R. Tichenor, administrator of the Ohio Bureau of Unemployment Compensation, was also a party to the action. He first banned SUB payments.

The companies sided with the union. They wanted to pay SUB. (A $20 million fund has been built up since August, 1956.) Terms of the steel-USW agreements provided that laid-off workers would receive money from the fund, plus state unemployment compensation. The two combined would equal about 65 per cent of takehome pay.

As the state law now reads, any person must report income received during his period of layoff. The amount will be deducted from his unemployment compensation payment for that week. In its ruling at Columbus, the court said that SUB payments are remuneration for personal services and should be deducted. The action reversed the ruling by two lower courts.

• **Positions Taken**—Steel companies are deferring action until they can study the court's 5 to 2 decision.

The Ohio Chamber of Commerce has announced that unless there is a change in its board's policy, chamber representatives will present arguments against incorporation of SUB provisions into the Ohio law.

Sen. Frank W. King (D., Lucas County), majority leader in the state Senate, said that he is sure the law will be amended to legalize SUB and also to liberalize unemployment compensation benefits. Senator King recalled that the legislature didn't bring in a bill to permit SUB payments last June. Labor leaders then figured that the SUB case would be won in the Supreme Court. Now, with a Democratic governor and legislature, the SUB bill will be pushed for passage soon after the solons convene Jan. 5.

• **Side Issues**—Senator King also announced that state legislators may call for increasing the unemployment benefit period to 39 weeks and recommend upping the state payments to 50 per cent of a worker's weekly wage. He said that the Bureau of Employment Security in the U. S. Labor Department previously recommended those changes on a national level. (The maximum in Ohio is $39 a week for a claimant with two dependents under 18. The benefit period has been increased temporarily from 26 to 39 weeks for those on layoff. The temporary law expires Apr. 4, 1959.)

Except for those who served in the armed forces, unemployment compensation payments are entirely subsidized by Ohio employers. (Administrative costs are paid by the federal government.) Employers entering the state plan pay into the Unemployment Compensation Trust Fund at a basic rate of 2.7 per cent of all taxable wages up to $3000 per calendar year ($81) for each eligible employee. Within four years, a reduced rate is possible if usage, based on layoffs, is low.

Patman Challenges SBA

REP. WRIGHT PATMAN (D., Tex.), chairman of the Small Business Committee, has again brought his quarrel with the Small Business Administration into the open.

This time he claims SBA has "vetoed" the Small Business Investment Act (STEEL, Sept. 15, p. 106) with its regulations governing the formation of investment firms designed to loan money to small businesses.

The congressman is particularly upset about the 5 per cent interest to be charged firms borrowing money from Uncle Sam. Generally, he indicates the regulations tend to favor big lenders. Example cited: SBA's plan to charter investment companies first. They don't require any funds from the government.

Representative Patman has long favored direct government ownership in small firms (through stock) rather than indirect loans. As small business' champion on Capitol Hill, he will no doubt go into the subject extensively this week when he begins Joint Economic Committee hearings on the relation of prices to economic growth. SBA's administrator, Wendell Barnes, denies Mr. Patman's charges. Outlook: A stormy time for Mr. Barnes next year when the Small Business Committee checks to see how well the Investment Act is working.

New Fight Against Highway Fund

Look for Sen. Albert Gore (D., Tenn.), chairman of the roads subcommittee, to lead a successful fight to kill the Highway Trust Fund in the next session. (Federal highway expenditures have been financed out of a trust fund built principally from gasoline taxes.)

With the buildup of opposition to a higher gasoline tax (to be proposed by the President in January), it looks as if Congress will have to kill the trust fund to keep the road program on schedule. The fund has been going into the hole for the last four months. Senator Gore promised highway executives last week: "There will be no stretchout" in the program beyond the originally planned 13 years. Money will have to come from general treasury funds if the trust is killed—probably booting the budget for fiscal 1960 another $1 billion. Sen. Francis Case (R., S. Dak.) ranking minority member of the roads subcommittee, also opposes higher gasoline taxes. He is talking up the possibility of a special bond issue to finance the program.

Check Defense Budget Carefully

When the new budget for the Defense Department appears in January, don't be misled by some bookkeeping changes. Firms concerned about their defense markets will see research & development accounts jump sharply, but there will be no real increase. Defense is shifting prototype costs, including fabrication and testing, from production accounts to R&D accounts.

Another point: Add the budget for the National Aeronautics & Space Administration to any increase in defense spending. Forecasters look for "slight" increase in fiscal 1960 over fiscal 1959's $40.8 billion defense bill, but if you add $1 billion for NASA, the figures become more realistic.

AEC To Get a Going Over

Next year looks like a natural for politically inspired investigations of federal agencies by Congress. The Atomic Energy Commission is on the hot seat because of our lagging atomic plane program and bottlenecks in the AEC-Budget Bureau relationship. Rep. Melvin Price's (D., Ill.) R&D Subcommittee wants several answers: 1. Why the Budget Bureau holds up AEC's funds. 2. Why it takes so long to negotiate a contract between AEC and private firms. 3. What is the "adequacy" of the AEC organization "to get things done."

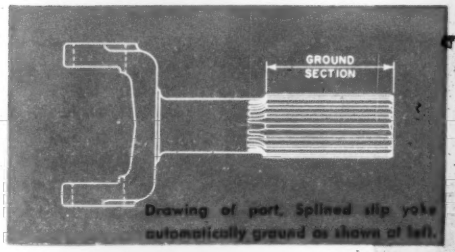
The Joint Atomic Energy Committee has learned of the top level meeting between the White House and Pentagon on the A-plane's future and is determined to use the meeting to hang the administration if a decision to advance the program more rapidly is not reached. If another study committee is appointed to review the project again, it will charge the administration with deliberately avoiding a decision until forced to act by Congress.

Right-To-Work Tactics Get New Slant

Don't look for big campaigns for right-to-work laws in industrial states like Wisconsin, Michigan, and Illinois, as some sources have been reporting. Following the November elections, the strategy has shifted to less industrialized states like New Mexico, Wyoming, Vermont, and Delaware. The effort will probably be made through the state legislatures rather than the popular vote route. Right-to-work enthusiasts are talking of wholesale shifts of new plants from "unionized" states to those with right-to-work laws.

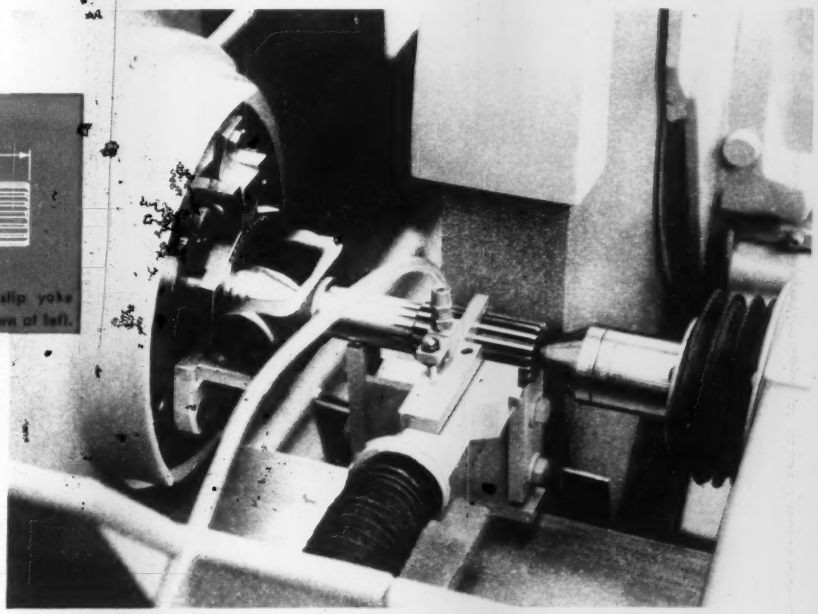
CINCINNATI keeps these tough grinding jobs under control

CINCINNATI



Drawing of part. Splined slip yoke automatically ground as shown at left.

FILMATIC



Horizontally mounted Air-Electric Gage Sizing Equipment, on CINCINNATI FILMATIC 10"R Plain Grinder, keeps size and production under control. Operation performed—grinding spline section of automotive splined slip yoke.

Cycle Time Stabilizer automatically compensates for wheel wear

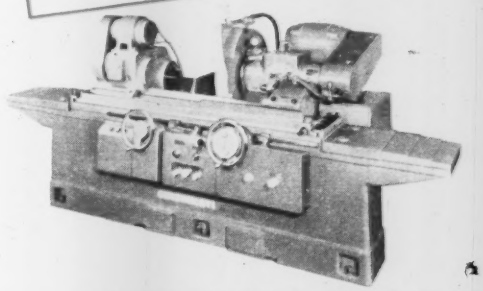
Spline sections and other cutaway diameters are tough on grinding wheels. Ordinarily, frequent adjustments for size and/or length of infeed cycle are required. Cincinnati cures these ills of rapid wheel wear with Automatic Air-Electric Gage Sizing. An exclusive extra advantage of this equipment, Cycle Time Stabilizer, does the trick. It automatically adjusts the length of infeed cycle to compensate for wheel wear and truing. Cycle time cannot increase; rate of production cannot decrease. ¶A horizontally mounted variation of Automatic Air-Electric Gage Sizing is incorporated in the CINCINNATI FILMATIC 10"R Plain Grinder abbreviated in the illustration above. Other automatic features which help to keep the cost of production at a minimum include:

Push-button Automatic Dual Rate Infeed
Behind-the-wheel Truing with Cycle Counter
Automatic Positioning of Headstock Spindle Gap Eliminator
Flat top table, work cradles, and hydraulic footstock

Write for catalog Nos. G-660-2 and G-661-1. Sweet's Machine Tool File contains brief specs.

CINCINNATI FILMATIC 10"R Plain Hydraulic Grinding Machine. Range and sizes listed below.

Size	Between-Center Lengths	Catalog
6"R 10"L	18" and 30"	G-660-2
10"R 14"L	18", 36", 48" 72" and 96"	G-661-1



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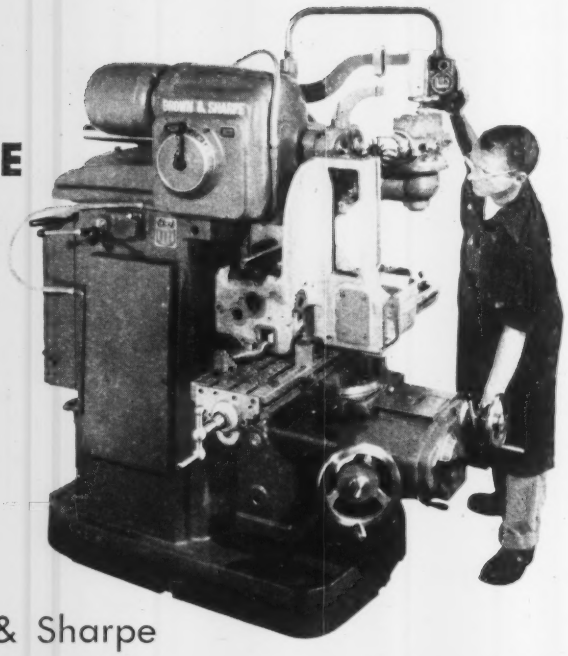

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28" Table feed
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25" Face of column to center line of vertical spindle
20½" Vertical feed
3½" Hand movement of quill in universal head.

Spindle Speeds
Horizontal Spindle
40 to 1530
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LOWER ORIGINAL INVESTMENT

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With the RANGEMASTER you *clamp the work piece once*, then machine all around it – mill, drill, or bore from any angle. You avoid relocating and re-alignment, with consequent risk of errors. You get more hours of machining time, and minimize set-up time.

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In the RANGEMASTER, both horizontal and vertical spindles have the same standard No. 40 M.M. taper for interchangeability of tooling. One set of tooling serves for multiple operations. There's no need for costly compounding of tool inventory.

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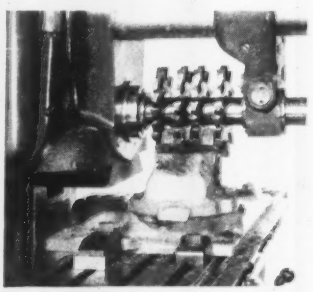
ALL THE ADVANTAGES OF A "RAM-TYPE" MACHINE WITH NO SACRIFICE IN CUTTING ABILITY

In the Rangemaster, all the following features are the same as in a conventional knee-type milling machine of corresponding size:

SAME SPINDLE MOUNTING –
SAME SIZE "BULL" GEAR –
SAME RANGE AND NUMBER OF SPINDLE SPEEDS –
SAME DIRECT DRIVE to both spindles, utilizing full power



Positioning of sliding head adjacent to the work piece permits mounting of cutters close to spindle nose for improved cutting ability.

PRECISION TOOLS • HYDRAULIC PRODUCTS • CUTTERS

Why Does Scrap Need Help?

		1958	1957
Because sales are down (first 8 months)	**50 per cent**	$1,718,000,000	$2,343,000,000
Because consumption is off (first 9 months)	**39 per cent**	14,527,000 gross tons	23,693,000 gross tons
Causing inventories to rise above year ago levels (as of Oct. 31)	**24 per cent**		

Scrap Sellers Seek Aid for 'Guaranteed Annual Wage'

"SO SCRAP WANTS a guaranteed annual wage," observed a steel representative in Washington. He was reacting to the news that a delegation from the Institute of Scrap Iron & Steel has visited the Office of Civil & Defense Mobilization.

• **Bogeyman?**—But reliable sources say the scrap folks asked for no specific form of help from government; they just laid their problems at OCDM's door.

They imply that steelmen have decided to do without a scrap industry, saying: "With consumers stressing the utilization of pig iron, home scrap, industrial scrap, and railroad scrap—to the almost total exclusion of dealer scrap in some instances—the industry has reluctantly concluded that it is confronted with a crisis it cannot alone cope with."

• **Four Point Program**—To offset the declining use of scrap by steelmakers, some scrap sellers would offer this program: 1. Less reliance on foreign ore by the steel industry because those sources could be shut off in an emergency. 2. Outright subsidies to scrap dealers. 3. A scrap stockpile via the Defense Production Act's authority. 4. Encouragement of exports, particularly to underdeveloped countries.

But insiders admit that such a program would only sustain life, not rebuild a healthy industry.

• **Sick, Sick, Sick**—Advancing technology has caught up with scrap in more ways than one. Steelmakers are using less of it, and dealers have to have a lot of cash. Twenty years ago, the typical scrap dealer had 35 per cent of his assets in equipment and 65 per cent in cash. Today, the opposite is true.

The industry remembers with irony that two years ago scrap consumers contended exports should be curtailed to protect the domestic supply. It argues now that exports must be boosted to maintain the scrap collecting machinery of the nation.

• **Standby**—The industry seeks an essentiality rating from the government so it could meet increased demands for scrap which would result, it contends, from an emergency requiring the steel industry to suddenly boost operations.

A minimum living wage, says Myron L. Chase, ISIS president, is $35 to $40 a gross ton for No. 1 heavy melting grade scrap. The industry has operated in that area since October, 1957. Annual contracts are required, he implies, to put scrap back on its feet.

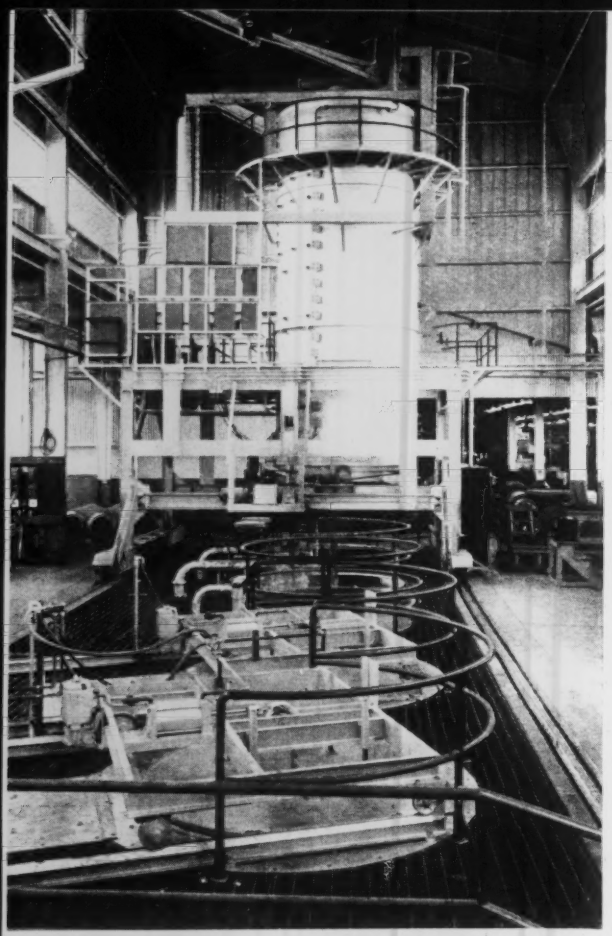
• **Help from Steel**—The steelmakers have spent millions on ore research; if they would spend 1 per cent as much on analyzing their scrap buying practices, "they would come up with some surprising results," says Mr. Chase.

Instead, he goes on, this trend continues: One mill (within the top dozen steelmakers of the country) has cut its scrap consumption from 40,000 or 50,000 tons a month to 10,000 tons.

The producers of scrap are really the ones to worry, adds ISIS, seeking any sort of outside help for its cause. (Many big automakers and other large scrap generators sell directly to steel mills, a practice which distresses dealers.)

• **Crux**—"Should a profitable scrap industry exist only when the steel industry is running above 90 per cent of capacity?" ask the dealers.

Whether government can answer them is doubtful. It seems only steel can give that answer, and it may already have by boosting its operations 59 per cent from October, 1957, to April, 1958, while its consumption of scrap increased only about 35 per cent.

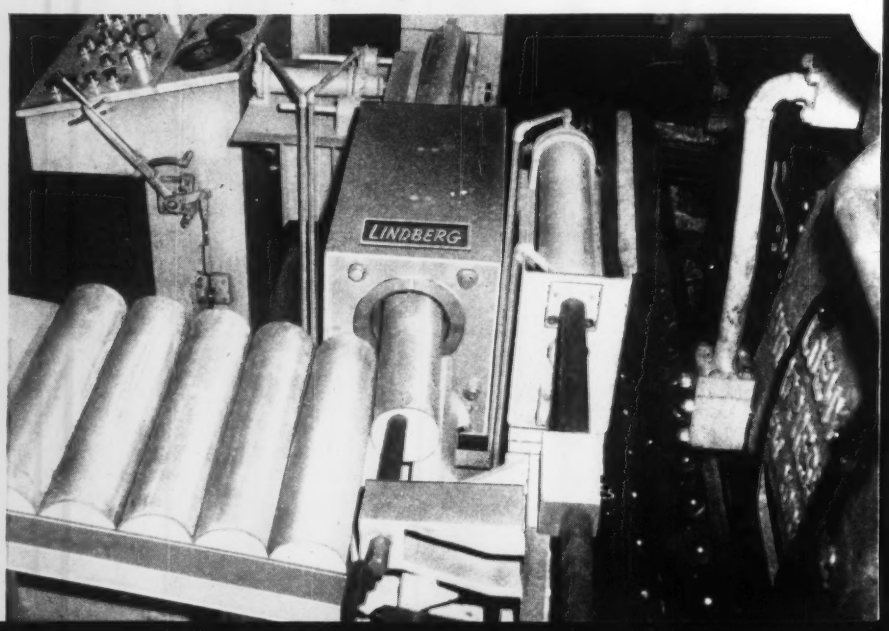


Improved Gantry type hardening furnace for missiles. Latest development of standard Gantry type, this huge furnace provides more economical, faster production and improved metallurgical qualities in treating missile parts. The installation consists of the electric, controlled atmosphere, Gantry type furnace and two draw furnaces, a hot water wash tank, a salt bath quench and a nitrogen generator. The Gantry type furnace moves under power over the entire installation to load or unload at any of the pit stations. Both design and installations by Lindberg.

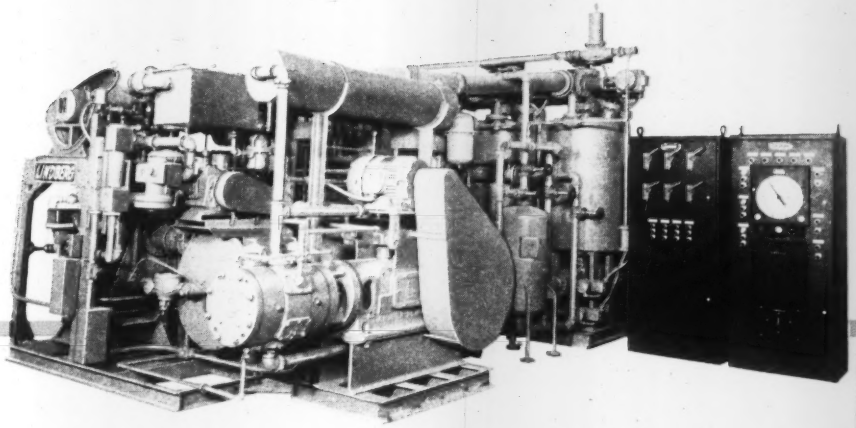
This year alone Lindberg has developed five major improvements in the application of heat to industry

Not so many months back business wasn't booming in the metalworking field. But through this period, Lindberg went steadily ahead with its policy of helping make business better by constantly seeking better ways to apply heat to industry. Fortunately, Lindberg has the research experts, the designers, the engineers to implement this policy. As evidence, shown on these pages are five major Lindberg developments of the past twelve months. In their respective spheres these offer industry more efficient, more productive, more economical industrial heating equipment.

Induction Aluminum Billet Heater. This exclusive new Lindberg induction billet heater provides aluminum extruders with an accurate, efficient solution to a difficult production problem. It features "Metered BTU's", an improved control system for heating aluminum billets. The heating rate of billet is controlled and each billet automatically delivered to the die-casting machine at the exact temperature required for most efficient extrusion.



Full information on any of these new Lindberg developments is available from Lindberg Engineering Company, 2441 W. Hubbard St., Chicago 12, Ill.



Hyni Nitrogen Generator. This Lindberg Hyni nitrogen atmosphere generator is the latest development in gas processing and assures nitrogen of higher purity than has ever before been achieved by other processes. It is the first unit to provide low cost, high purity nitrogen by a dry, completely automatic process. It is suitable for any application where a high nitrogen, CO_2 free, dry atmosphere is required. The unit functions automatically, and once the generator is started, the entire operation is completely automatic and continuous.

Over the years Lindberg has consistently pioneered major advancements in industrial heating equipment . . . the famous Cyclone furnace, applying the first 100% forced convection heating principle . . . the first high temperature (2200° F.) endothermic generator . . . the development of controlled atmosphere generators, the creation of dew point equilibrium curves to establish proper atmosphere values and the exclusive Lindberg Carbotrol to maintain these values automatically . . . the "dimple" vertical radiant tube for fuel fired furnaces . . . the revolutionary CORRTHERM electrical heating element. Lindberg equipment and Lindberg planning can help you find the most effective answer to any problem of applying heat to industry. We cover the field, heat treating, melting and holding, brazing, enameling furnaces, ceramic kilns, high frequency units, and are in the ideal position to recommend just the type of equipment most suitable for your needs. Consult your local Lindberg Field Representative (see the classified phone book) or get in touch with us direct.

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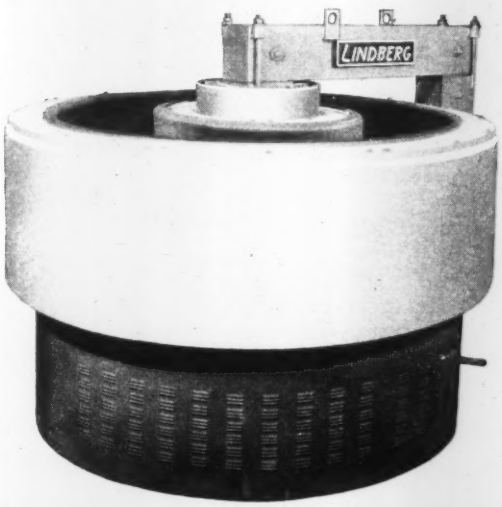
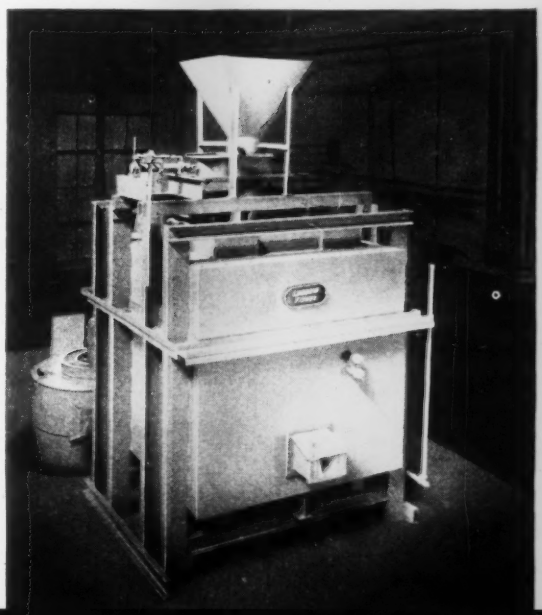
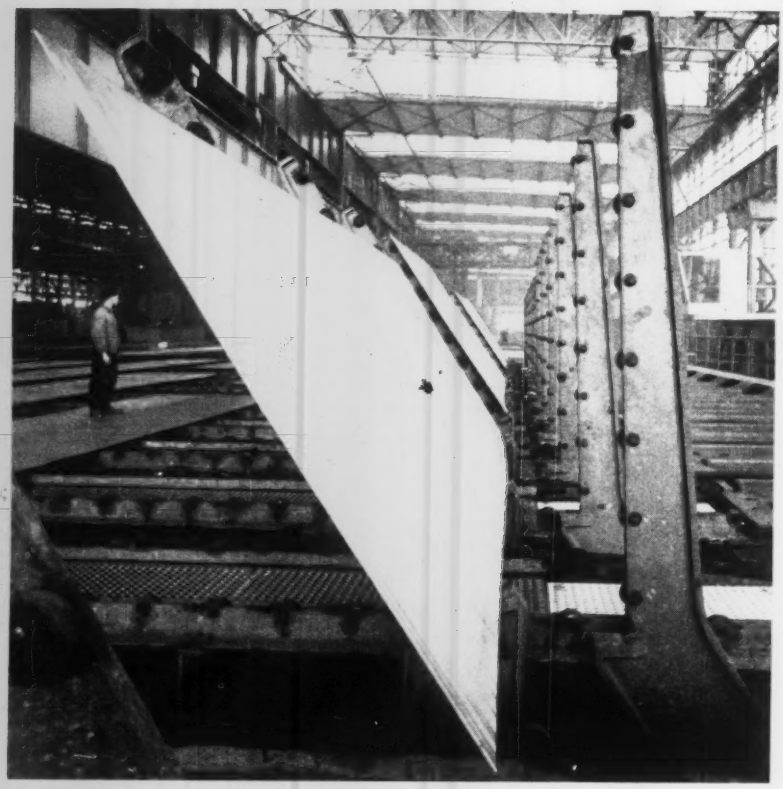
Induct-O-Ring Rotary Salt Bath Furnace. Offering for the first time an electric salt bath furnace that can be shut down over night or week end and regain efficient operating temperature quickly. Positive quality control is provided by rotary action of furnace and variable speed drive which insure exactly same time in bath for all parts. Gives precise temperature uniformity and control unequalled by any other salt bath furnace design. Offers greatly lowered operating, maintenance and initial investment costs compared with standard externally heated pot or electrode types.



Electric Controlled Atmosphere Dry Hearth Melting Furnace. This new Lindberg-Fisher Melting Furnace operates electrically and oxidation of aluminum, or melt loss, is reduced because the entire system can be pressurized with atmosphere. The only oxides incurred are those from the surface of the scrap, as charged. The furnace contains a sloping silicon carbide dry hearth which directs the molten aluminum through a covered trough into the companion holding furnace. Substantial savings in lower melt loss and maintenance is low. Particularly applicable for scrap with steel inserts.





Dual controls operate this equipment for turning sheets in a German barrel works

West Germany Can Rejoice As Free Trade Blossoms

Industry welcomes U. S. investment and knowhow as trend to common market in Europe brings more specialization, higher production volume. Steel capacity increased

TARIFF walls are tumbling in Europe. That's good news for West Germany, now completing a year in which steel production declined 5 to 7 per cent and exports dropped, compared with 1957.

The European Coal & Steel Community has abolished trade barriers in steel. The six-nation European common market (it includes West Germany, the Netherlands, Belgium, Luxembourg, France, and Italy) will initiate a 10 per cent reduction in customs rates on Jan. 1, 1959.

West Germany and France are the strongest nations in the common market. Members cut tariffs and raise import quotas to stimulate trade with each other. They maintain a common tariff on imports from other nations. By 1970, all tariffs and import quotas between common market nations will be eliminated.

• **More Specialization**—The common market will bring a thorough overhaul of industry within Europe. West German companies will discard some product lines in which they compete with Italians, French, and others. Manufacturers in other nations will reciprocate.

Benefits will include larger volume production and a greater market for a smaller product line. Some German small businesses hope to grow out of marginal size. Despite the trend to a common market, German industry continues to face a strong competitor in Great Britain.

England opposes the common market. That nation suggests a free trade area to include 12 European nations, each of which could establish individual tariff policies. Germany and France have agreed to reject this proposal, although they will extend the January, 1959, tariff reductions to include English goods. The two nations also will promote multilateral associations of common market nations with outsiders.

• **American Interests**—Growth of the common market is attracting U. S. investors. The number of licensing agreements is increasing rapidly. Special alloy steel products developed in the U. S. are being produced at a plant in Dinslaken, jointly owned by Armco Steel Corp. and August Thyssen-Huette A.G. About 30 large electronic computers, mainly of U. S. design, have been installed in West Germany. Americans are investing knowledge in addition to capital. Several management consulting firms in the U. S. have large offices in Germany. American public relations firms have set up shop in such German cities as Dusseldorf.

German steelmakers are increasing shipments to this country, as U. S. wire mills can attest. Barbed wire, nails, wire rods, structurals, plates, and tubes are flowing into coastal areas and the Great Lakes region. With completion of the St. Lawrence Seaway, shipments of sheets to Detroit may be intensified, but no large-scale increase in exports to this country is predicted in 1959.

Germany is shipping about 125,000 cars and trucks to the U. S. this year. Shipments may increase in 1959 if Volkswagen can trim its six-month order backlog. About 90 per cent of West German cars shipped to the U. S. are Volkswagens.

With sales to some western countries slackening, Germans may boost their exports to the Communist bloc, including China. Exports to eastern nations have been negligible, except for a 400,000-ton shipment of shapes and tubes to China last summer.

Despite a drop in steel production from 27 million net tons in 1957 to an estimated 25.4 million tons in 1958, optimism remains high in this West German industry.

Actual consumption of the metal is reportedly 1 to 2 per cent higher than in 1957, but an inventory cutback among steel buyers keeps production lower.

Anticipating the end of inventory reductions, steelmakers will build their capacity to 32.3 million tons by the end of 1959 and to 33.4 million tons by 1960. Steelmakers expect an annual increase in capacity of 2.5 to 3 per cent during the next decade.

France Flexes Muscles

FRANCE, which shares with West Germany leadership of the six-nation European common market, also shares the long range optimism of other member nations.

France's industrial production is double the prewar level and is expanding by about 10 per cent per year. Frenchmen claim they enjoy the fastest growth rate in the western world. Employment is high and productivity has increased by 31 per cent in the last five years.

• **Foreign Markets Grow**—Exports are being promoted. Among leading products are the Renaults shown on this page. Steel exports are on the rise, too. In nine months of 1958, they totaled almost 3 million tons.

The auto industry, fourth largest in the world, is one of the brightest aspects of industry in France. Automakers in 1957 produced 724,000 passenger cars and 204,000 trucks, a 12 per cent gain over the previous year.

Car and truck registrations have increased almost 20 per cent in two years.

In the first ten months of this year, auto plants produced 929,481 vehicles. Estimated November and December production: 180,000 vehicles. Total output for the year will approximate 1.1 million units.

• **Auto Exports Rise**—Passenger car exports increased from 150,000 in 1957 to an estimated 240,000 vehicles in 1958. Most spectacular customer is the U. S. Some 45,100 French cars were sold in the U. S. in 1957, but this total was reached in seven months of 1958. Probable total shipments to the U. S. in 1958: 75,000 to 80,000 units.

Renault built its exports to the U. S. from 35,000 cars in 1957 to an estimated 60,000 in 1958. That firm produced 336,000 passenger cars last year and exported 35 per cent of them.

Simca shipped 12,031 cars to the U. S. in the first nine months of 1958, compared with only 3374 in 1957. Having completed a sales agreement with Chrysler Corp., Simca expects to send 60,000 cars to the U. S. in 1959.

• **Tough Selling in Europe**—Despite formation of a common market, France faces problems similar to those of the U. S. when it competes in Europe. France has comparatively high labor costs and comprehensive social security systems. To compete successfully, France faces the choice of cutting its labor costs or raising the economic levels of its neighbors.

Frenchmen believe success of ECSC proves the workability of the common market. Steel and pig iron output in 1958 furnishes proof of the strength of the nation's industry. While over-all ECSC steel production in the first nine months of 1958 dipped 1 per cent from the corresponding period of 1957. French steel output advanced 6 per cent and pig iron output grew by 1.5 per cent. Steel output was 12 million tons in the first nine months of this year.

• **Steel Keeps Growing**—Steelmakers anticipate an expansion of 8 per cent each year for the next three years. This will raise the country's steel capacity to 18.5 million tons by 1961.

New Renaults being swung aboard ship for export to U. S.

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Photo, courtesy of Greco Manufacturing Company, Chicago, and Belli and Belli Co., architects and engineers.

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Curb weight:	1,716 lb	Torque:	53/2,500
Cap.:	4 pass.	Axle Ratio:	4.4:1

Squire Station Wagon

Midwest price:	$1,801	Engine:	4 cyl., side valve
Wheelbase:	87 in.	Displacement:	71.5 cu in.
Length:	141.5 in.	Horsepower:	36/4,500 rpm
Height:	62.2 in.	Comp. Ratio:	7.0:1
Curb weight:	1,870 lb	Torque:	53/2,500
Cap.:	6 pass.	Axle Ratio:	4.4:1

Consul Mark II

Midwest price:	$2,084	Engine:	4 cyl., OHV
Wheelbase:	104.5 in.	Displacement:	103.9 cu in.
Length:	172.0 in.	Horsepower:	59/4,200 rpm
Height:	61.5 in.	Comp. Ratio:	7.8:1
Curb weight:	2,504 lb	Torque:	92/2,300
Cap.:	6 pass.	Axle Ratio:	4.1:1

Ford, GM Imports Push Volkswagen

IMPORTED CAR BUFFS are well aware of names like Volkswagen and Renault, but until this year they've paid less attention to cars produced overseas by Ford Motor Co. and General Motors Corp. Their sales are beginning to make a dent in the import field.

Of the two firms, Ford has made the biggest splash with its English Fords and German Taunus. It offers four wheelbases, eight basic models, and more than 20 body styles, including four English van and bus models. All the cars are styled along American lines and built with unitized bodies. Manual transmissions are standard, but most models offer optional semiautomatic shifts. Gasoline consumption is 25 to 35 mpg. Suggested import prices (above and Page 100) include federal excise tax, ocean freight, handling, and import duty. They exclude license fees, state and local taxes, and dealer installed accessories.

• **So Many Sales**—In 1950, two years after it started importing, Ford sold 1,869 English Fords. Last year's import sales were 17,062. Ford says sales will be about 36,000 this year; it's looking for 40,000 in 1959. There are 600 English Ford dealers in this country.

Early this spring, the company started importing its German built Taunus, and company estimates call for 2000 deliveries this year. There are 120 Taunus dealers in the country, and Ford doesn't deny reports it wants to double that number. The Taunus plant at Cologne, Germany, is being enlarged, and Ford predicts it will sell 10,000 Taunuses in the U. S. next year—giving the company total import sales of 46,000 or 9 per cent of the anticipated 1959 import market (400,000 units).

• **GM Uses Soft Sell** — Ford has been pushing imports aggressively,

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Zephyr Convertible

Midwest price:	$2,624	Engine:	6 cyl., OHV
Wheelbase:	107 in.	Displacement:	155.8 cu in.
Length:	178.5 in.	Horsepower:	86/4,200 rpm
Height:	61.9 in.	Comp. Ratio:	7.8:1
Curb weight:	2,691 lb	Torque:	136/2,000
Cap.:	3 pass.	Axle Ratio:	3.9:1

Taunus de Luxe

Midwest price:	$2,224.50	Engine:	4 cyl., OHV
Wheelbase:	102.5 in.	Displacement:	103.62 cu in.
Length:	172.2 in.	Horsepower:	67/4,400 rpm
Height:	57.7 in.	Comp. Ratio:	7.1:1
Curb weight:	2,260 lb	Torque:	98/2,200
Cap.:	6 pass.	Axle Ratio:	3.9:1

but GM seems to be offering its German Opel and English Vauxhall mainly to appease Buick and Pontiac dealers who sell the cars. Monthly import quotas were set at 1500 units for each make this year, but Pontiac reports 16,371 Vauxhalls have been imported through November. Sales have bettered 2000 a month since June. September registrations show the British job is in fourth place among imports, directly behind the English Fords (Volkswagen and Renault are first and second).

Buick reports about 17,000 Opels have been imported during the same period. That's quite a change from two years ago when the only Opels seen in this country were those brought back by servicemen (See STEEL, Dec. 10, 1956, p. 111).

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	641,591
February	392,112	570,650
March	357,049	578,356
April	316,503	548,656
May	349,474	531,413
June	337,355	500,266
July	321,053	495,625
August	180,324	525,363
September	130,426	283,862
October	261,696	327,362
November	514,099	578,600
11 Mo. Total	3,649,448	5,581,744
December	.....	534,714
Total	.....	6,115,458

Week Ended	1958	1957
Nov. 8	125,279	136,742
Nov. 15	117,688	141,904
Nov. 22	138,727	151,846
Nov. 29	123,088	114,795
Dec. 6	146,045†	139,506
Dec. 13	150,000*	145,503

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

• **Chrysler's Starting** — The other member of the Big Three is just getting into the import game. Chrysler Corp. officially took over marketing of the French built Simca in September. The company admits its prime reason for acquiring Simca stock and distribution rights is to make it competitive in the European market place.

Nonetheless, Chrysler wants 700 of its dealers to handle the Simca in this country. The French automaker has registered 13,031 cars in the U. S. through September. Almost all were sold through non-Chrysler dealers. Chrysler says it's shooting for 15 per cent of the 1959 import market (60,000 units). There are nine Simca models available now; two more will be introduced next May.

• **Why Build Here?**—Such growth makes one wonder why Ford wants to build a smaller car in this country. There seem to be three basic reasons: 1. Ford's (and GM's) U. S. built car will be slightly larger than its similarly priced imports. Marketeers are convinced that a slightly larger car is what American economy car buyers really want. 2. Import duties and shipping costs reduce the profits on foreign built cars. 3. The expanding European car market is likely to consume most of the future overseas production of these companies.

Exhaust Notes

• Ford Div. started building its luxury Galaxie series last week. It features six body styles, including a retractable hardtop. The Galaxie will go to dealers next month. It lists $48 higher than Ford's Fairlane 500 series.

Beat Experts Contest

Have you entered STEEL's *Beat-the-Experts contest? You can win a scale model of General Motors' Firebird III if you make the best guesstimate of how many automobiles will be produced in the U. S. during the first six months of 1959. Ten runners-up will receive color prints of a dream car. Entry blanks can be found in previous issues of* STEEL.

The Universal Wire Spring Company, Bedford, Ohio, uses high carbon MB spring wire from 7½ to 12½ gauge in these new Uniflex springs.

"J&L's spring wire speeds production of new Uniflex springs"

...states Universal Wire Spring Co. official

"We have to fold springs tighter than eyer to adapt them to the narrower spaces available in modern designs. The spring wire used for our sinuous corrugated Uniflex springs must then be exceptionally uniform in tensile strength and resistant to deflection under load, and J&L's spring wire has consistently been of this quality," reports a Universal purchasing executive.

J&L achieves this uniformity in spring wire through rigid quality controls in every phase of production from ore mine through finished product. Only first-class quality controls at the steel mill, in balancing chemical analysis, heat treating and drafting, can guarantee uniform spring wire for modern volume production. Every coil of J&L wire is thoroughly tested for uniformity of physical and dimensional characteristics. The resulting high quality speeds production and reduces rejects in automatic operations such as those of Universal.

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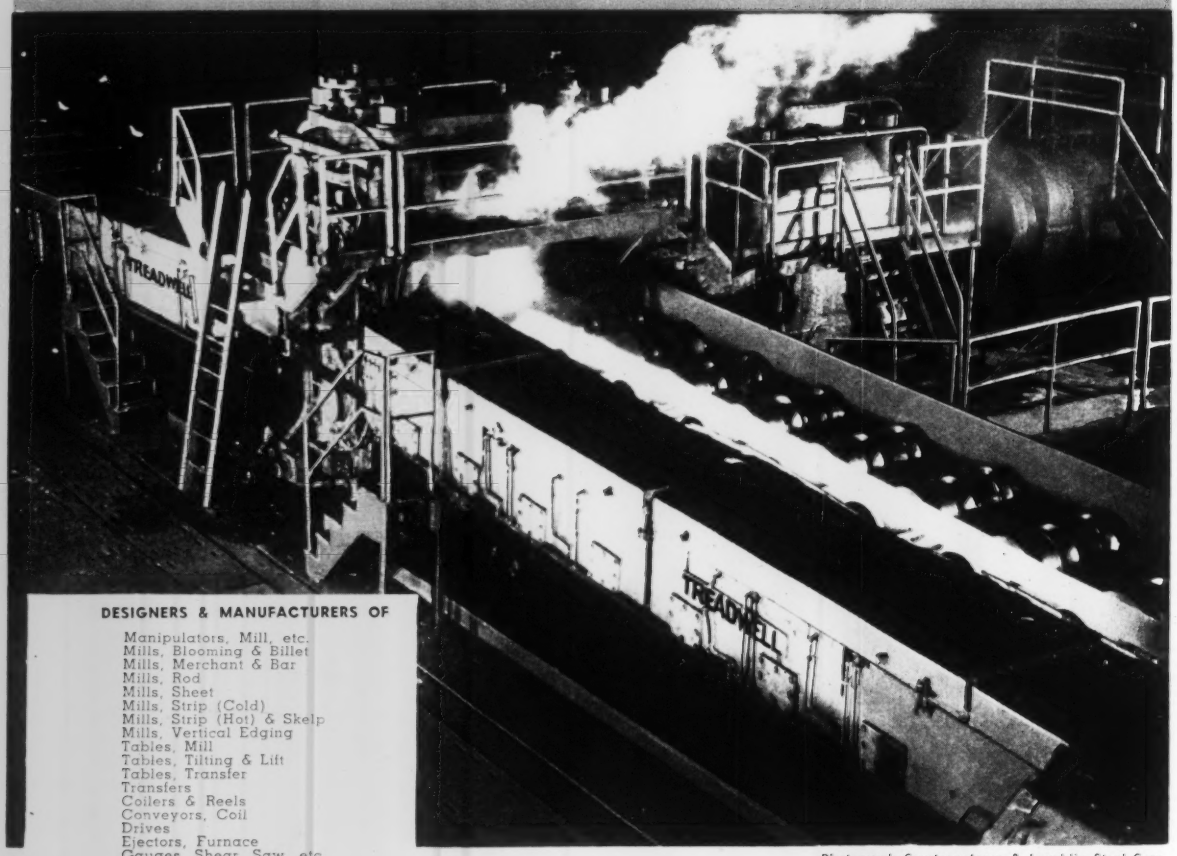

Photograph Courtesy Jones & Laughlin Steel Corp.

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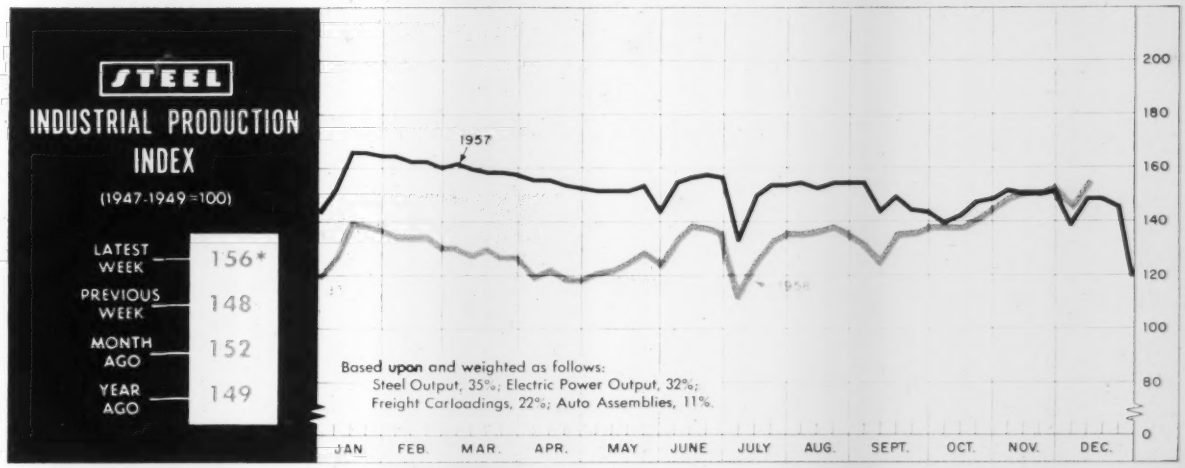

*Week ended Dec. 6.

Autos, Electricity Push Index Up

NEW 1958 HIGHS in two of the four elements making up STEEL's industrial production index (above) have pushed it to its highest point in nearly a year and a half. The preliminary reading for the week ended Dec. 6 is 156 (1947-49 = 100), a recovery of 8 points from the revised Thanksgiving week mark of 148.

The most encouraging sign on the metalworking front is the rate at which new cars are being built. Production of autos and trucks during the week ended Dec. 6 totaled 169,420 units, says *Ward's Automotive Reports*, the highest mark since mid-November, 1957, and it will go even higher before the month is over, unless labor troubles continue to take their toll. Schedules call for output of about 600,000 autos, compared with November's 514,099 units.

• **Catching On**—Retail sales are finally coming up to expectations. During the last ten selling days in November, dealers sold new cars at a rate of 18,500 a day. The month started out at an 11,740 per day rate. Even if sales were slower, production schedules would remain strong because dealers' stocks—at 500,000 units—are still well below year-ago levels.

Heavier auto production schedules are being felt in supplier industries, especially steel. After slumping to a seven week low of 1,985,000 net tons, the industry was expected to jump back close to the year's best levels last week. Aside from renewed automotive buying, continuing strength is being shown in other important markets, such as appliances and construction. But steel production has had little influence on the movement of production indexes for the last two months. It has fluctuated within a relatively narrow range of 40,000 tons a week.

• **Charging Up**—If preliminary estimates hold up, the electric utility

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,015[1]	1,985	1,770
Electric Power Distributed (million kw-hr)	12,900[1]	12,274	12,315
Bituminous Coal Output (1000 tons)	7,545[1]	8,745	8,184
Crude Oil Production (daily avg—1000 bbl)	6,975[1]	6,983	6,850
Construction Volume (*ENR*—millions)	$399.1	$273.0	$201.0
Auto, Truck Output, U. S., Canada (*Ward's*)	177,893[1]	153,187	167,760
TRADE			
Freight Carloadings (1000 cars)	600[1]	539	618
Business Failures (Dun & Bradstreet)	244	260	235
Currency in Circulation (millions)[3]	$32,057	$31,825	$31,666
Dept. Store Sales (changes from year ago)[3]	+1%	+2%	−20%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,847	$23,231	$22,099
Federal Gross Debt (billions)	$282.8	$283.5	$274.8
Bond Volume, NYSE (millions)	$31.9	$27.7	$28.5
Stocks Sales, NYSE (thousands of shares)	17,565	16,941	11,077
Loans and Investments (billions)[4]	$95.2	$93.8	$86.1
U. S. Govt. Obligations Held (billions)[4]	$32.5	$31.3	$25.0
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	217.5	217.5	206.5
All Commodities[7]	119.0	119.1	117.9
Commodities Other than Farm & Foods[7]	126.9	126.9	125.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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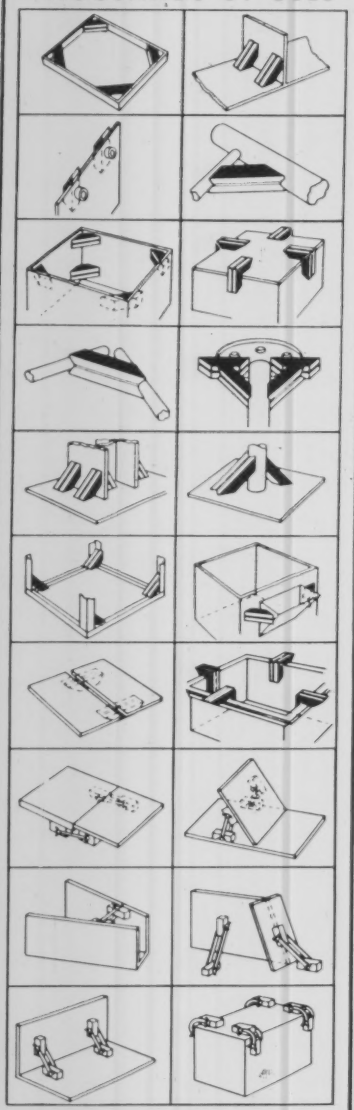

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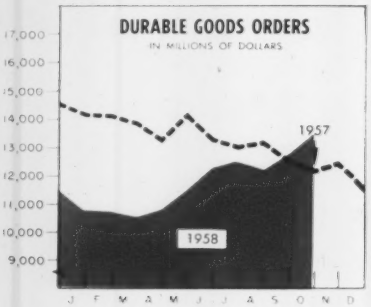
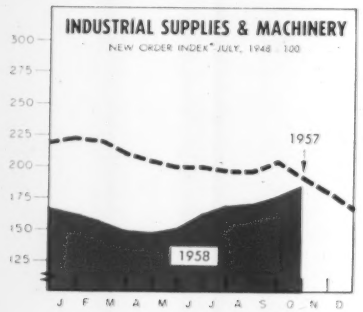
THE BUSINESS TREND





	New Orders* 1958	New Orders* 1957	Sales* 1958	Sales* 1957
Jan.	10,704	14,176	12,646	14,941
Feb.	10,688	14,102	12,038	14,808
Mar.	11,488	13,853	11,670	14,198
Apr.	10,832	13,234	11,532	14,254
May	11,423	14,115	11,643	14,296
June	12,245	13,249	12,086	14,207
July	12,512	13,005	12,256	14,573
Aug.	12,177	13,160	12,385	14,297
Sept.	12,800†	12,519	12,700†	14,132
Oct.	13,500†	12,154	13,000†	13,932
Nov.	.....	12,434	.....	13,548
Dec.	.....	11,399	.....	13,092

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.
Charts copyright, 1958, STEEL.

	1958	1957	1956
Jan.	163	221	190
Feb.	157	219	190
Mar.	149	210	190
Apr.	148	203	195
May	152	199	199
June	164	199	197
July	170	197	203
Aug.	172	197	211
Sept.	178	203	203
Oct.	187	192	206
Nov.	...	180	220
Dec.	...	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

industry will post an all-time high for the week ended Dec. 6. Figures compiled by Edison Electric Institute show that recent weeks have been running 5 per cent or more ahead of their 1957 counterparts. The seasonal bulge following the Thanksgiving holiday should boost output to 12.9 billion kw-hr of electricity, compared with the previous high of 12.851 billion recorded during the second week in July.

Unfortunately, only a small part of the increase can be traced to greater industrial production. It stems mostly from the lighting of Christmas decorations in the nation's shopping centers.

Freight carloadings remain about 2 per cent below their corresponding 1957 levels. There are indications that business is stronger than anticipated, partially offsetting the effects of a seasonal downtrend.

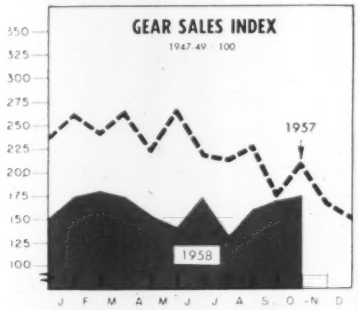
Slowdown Is Healthy Sign

Many economists view the slowdown in production during November as a normal reaction in an otherwise fairly fast recovery, but "few find in it any evidence that the rise is ending or the trend reversing," claims the First National City Bank of New York. To the contrary, the bank's economists feel the "recovery will be more soundly based, less vulnerable, and likely to go farther in the long run if restraint is shown now."

Economists at New York's Guaranty Trust Co. tend to view November as a strike-interrupted period in the uptrend rather than a natural slowdown. "In terms of the number of workers involved and manhours lost, the work stoppages have been worse than anything since the middle of 1956. In addition to disrupting automobile assemblies, labor disputes have curtailed production and depressed income in the machinery, electrical machinery, glass, and fabricated metal industries."

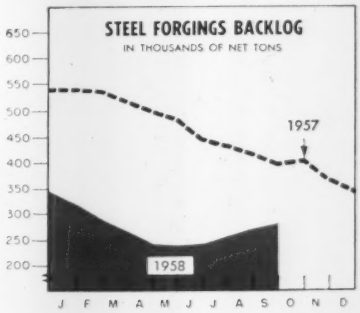
The inference is that without strikes, the Federal Reserve Board's industrial production index would not have been held to 1 point gains during September and October. Now that most of the labor troubles are over, the FRB index should continue its 2 and 3 point gains during November and December.

A poll of 140 financial leaders at a meeting of the National Association of Credit Management indicates that business can expect stability in the coming months, part-



	1958	1957	1956	1955
Jan.	174.5	259.3	245.5	140.9
Feb.	179.1	239.5	256.2	148.5
Mar.	173.7	262.4	276.5	172.8
Apr.	153.2	221.7	264.7	179.8
May	142.2	263.2	275.6	205.2
June	173.8	215.9	245.4	193.5
July	133.3	211.4	286.7	201.7
Aug.	162.1	225.8	219.5	217.6
Sept.	170.7	174.9	230.5	246.5
Oct.	175.9	207.0	299.8	227.6
Nov.	....	165.3	216.2	210.4
Dec.	....	150.8	235.7	245.5
Avg	....	216.4	254.4	198.3

American Gear Mfrs. Assn.



	Shipments 1958	Shipments 1957	Unfilled Orders 1958	Unfilled Orders 1957
Jan.	108	148	318	537
Feb.	93	135	288	533
Mar.	92	146	266	517
Apr.	83	139	242	497
May	78	135	240	479
June	87	128	242	445
July	67	104	257	431
Aug.	80	115	270	417
Sept.	89	117	280	397
Oct.	....	126	....	401
Nov.	....	105	....	365
Dec.	....	99	....	343

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

ly because production is fairly well in line with consumption. Dr. John W. Harriman, economist for the Tri-Continental Corp., New York, says: "The next major development should be a substantial increase in consumer purchases of durable goods." This places great importance on the automotive industry.

Orders Presage Upturn

That the trend is securely pointed upward is obvious in the light of recent reports on new orders and shipments, especially in the durable goods sector. (See graph and table, Page 104.) Orders for all manufacturing industries topped the $27 billion mark for the first time since the recession started. For durables, the gain was one of the biggest since the upturn started in May.

Even though incoming business exceeded shipments on a seasonally adjusted basis, manufacturers' backlogs continued to decline. The raw figures still showed that shipments were ahead, but that situation could be reversed within a month or two.

Seasonally adjusted inventories stood still in October, perhaps marking the end of inventory liquidation and the beginning of stock buildup in November.

Building Contracts Slip

Something is amiss in the construction industry. Awards of new contracts for heavy construction projects, as measured by *Engineering News-Record*, dipped 10 per cent below the corresponding 1957 total at a time when most observers were predicting record levels next year for work put in place. (This year's contracts will be next year's work.)

A dip at this time of year is not particularly surprising—it's seasonal. But to fall beneath 1957's mediocre level is to invite some doubt about the glowing forecasts.

But there are reports which tend to uphold the predictions. Dun & Bradstreet Inc. says that building permits in 217 cities in October topped the previous high for the month by 26.2 per cent.

For the short term, things are still booming, with work put in place last month topping the year-ago figure by $200 million. At $4.4 billion, compared with September's $4.7 billion, the decline was less than seasonal.

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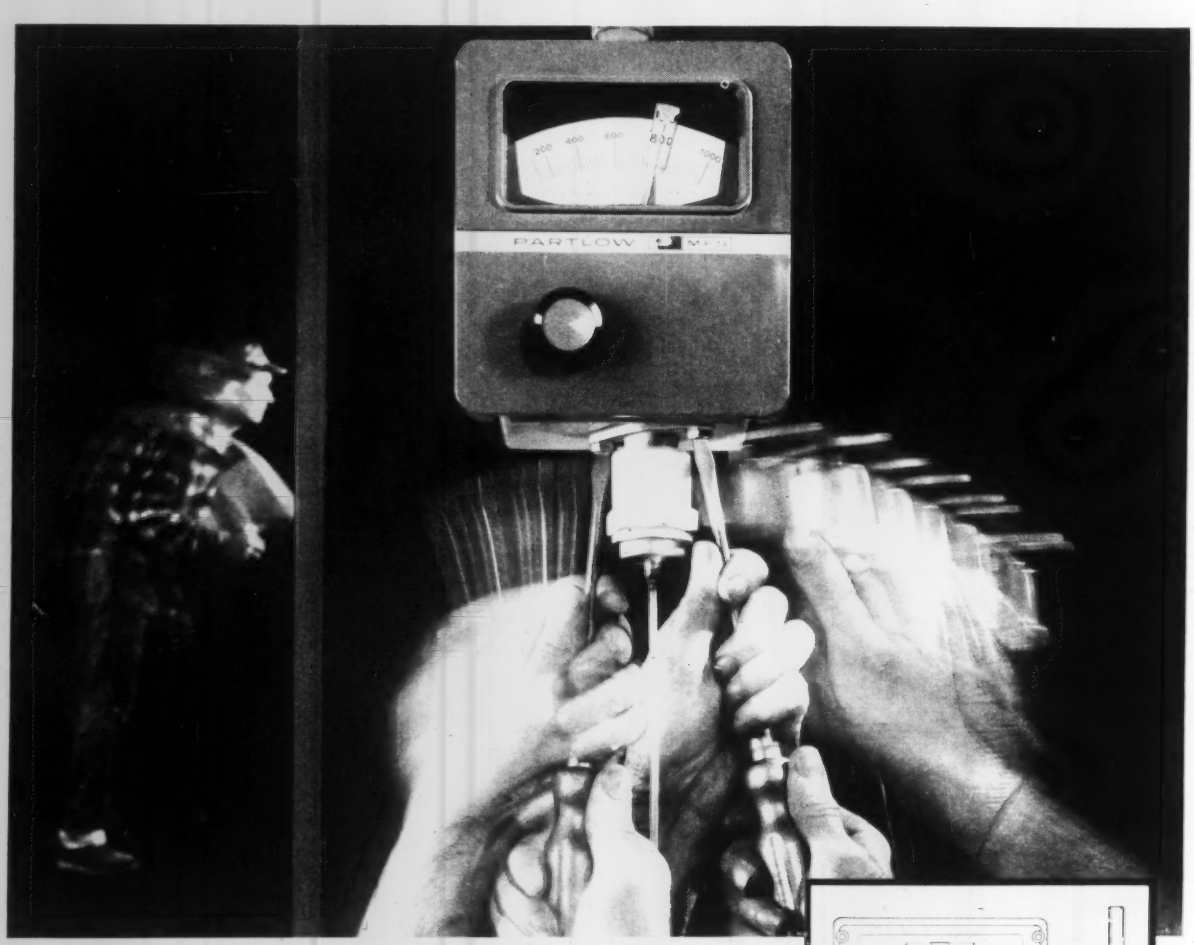

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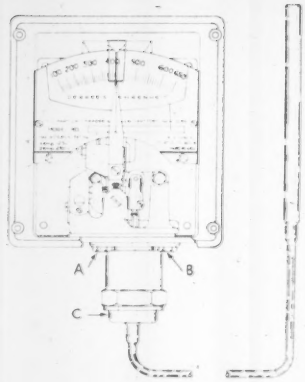

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Gifford-Wood appointment

ROBERT C. TROW
King-Seeley v. p.

JAMES B. PASCHAL
Alemite & Instrument post

PETER B. McSHERRY JR.
Parker-Kalon sales v. p.

Hans H. Sonderegger was appointed director of engineering and research for **Gifford-Wood Co.**, Hudson, N. Y. For the last 30 years he has been with Sauerman Bros. Inc., Bellwood, Ill., and Link-Belt Co., Chicago.

Wayne Miller was named chief metallurgist of the **Cleveland Rock Drill** plant, Le Roi Div., Westinghouse Air Brake Co. He held a similar position with Tinnerman Products Inc., Cleveland.

Pittsburgh Bridge & Iron Works, Pittsburgh, appointed **David B. Hughes** sales manager; **Edward T. Baughman**, assistant to vice president; **Robert L. Haenel**, chief engineer.

Donald C. Kane was named sales manager for the western division plant of **Industrial Tectonics Inc.**, Compton, Calif.

L. E. Hart was made director of manufacturing engineering, **Hussmann Refrigerator Co.**, St. Louis. He was manager of manufacturing engineering at the Nashville, Tenn., plant of Avco Mfg. Co.

Jack D. Edwards was named manager, central production planning department, **Republic Rubber Div.**, Youngstown, Lee Rubber & Tire Corp.

Philip M. Dinkins was elected president, **General Aniline & Film Corp.**, New York, to succeed **John Hilldring**, now chairman. Mr. Dinkins was vice president-general manager, Dyestuff & Chemical Div.

Robert C. Trow was elected vice president, **King-Seeley Corp.**, Ann Arbor, Mich. He also was made general manager, Queen Products Div., formerly a subsidiary company. **Rayville A. Trow**, founder and former president of Queen, continues with the division as a consultant. **Robert J. Lickteig**, sales manager for the Scotsman Ice Machine line, was also named vice president of the parent corporation.

James B. Paschal was appointed manager of quality control, **Alemite & Instrument Div.**, Stewart-Warner Corp., Chicago. He succeeds **O. R. Swanson**, recently appointed assistant to the manager of manufacturing.

Norman E. Bateson was made director of research and development for **Pullman-Standard Car Mfg. Co.**, Chicago. He succeeds **O. C. Maier**, resigned as of Dec. 1 to accept a position as associate dean of engineering at the University of Massachusetts.

William C. Hanna was made field sales manager for **Superior Tube Co.**, Norristown, Pa. **Lloyd M. Huston** was made sales-service manager.

Leland A. Doan replaces **R. L. Curtis** at San Francisco as western division general manager of **Dow Chemical Co.**, Midland, Mich. Mr. Curtis continues as a vice president and will remain as senior officer on the West Coast. **Dr. E. O. Barstow**, of Midland, retired as vice president, but was named to the new post of honorary chairman.

Peter B. McSherry Jr. was elected vice president-sales, **Parker-Kalon Div.**, General American Transportation Corp., Clifton, N. J. He was sales manager, Socket Screw Products Div., Bristol Co.

John L. Taggart joined **American Bosch Arma Corp.**, Hempstead, N. Y., as director of marketing, with primary responsibilities in defense programs. He was executive vice president and general manager, Liberty Aircraft Co.

Alvin T. Hanson Jr. was named manager of **Chrysler Corp.'s** New Process Gear Div., Syracuse, N. Y. He was manufacturing manager of the company's plant at Indianapolis. **James W. Craft** was named director of organization for Chrysler.

Ray W. Fanning, plant manager from 1949 to 1957 of **Morrison Steel Products Inc.**, Buffalo, returned to the company as works manager, with enlarged responsibility. He recently served as plant manager for Industrial Metal Works Corp.

Edwin S. Elliott was named executive vice president, **Hill Mfg. Co.**, Wauseon, Ohio.

William J. Patterson was appointed comptroller, **Ford Instrument Co.**, division of Sperry Rand Corp., Long Island City, N. Y.

Gerard W. Metz was named manager of construction for **Lehigh Construction Co.**, subsidiary of Lehigh Structural Steel Co., Allentown, Pa. **Donal J. Lonergan** was

R. S. STRICKLAND R. E. KLARE R. W. MUZZY

Federal-Mogul-Bower Bearings management posts

named assistant manager-construction.

R. S. Strickland, former vice president-sales and marketing, **Federal-Mogul-Bower Bearings Inc.**, Detroit, was elected vice president-general manager, bearing divisions. He heads a new grouping of the bearing divisions (Bower, Federal-Mogul, and Bearings Co. of America). **R. E. Klare**, former general manager, Federal-Mogul Div., was promoted to a new post of vice president-operations, bearing divisions. He is succeeded by **R. W. Muzzy** as general manager, Federal-Mogul Div.

Rudolph B. Flershem retires as chairman and chief executive officer of **Buffalo-Eclipse Corp.**, North Tonawanda, N. Y. He is succeeded by **Ralph F. Peo**, president of Houdaille Industries Inc., which acquired control of Buffalo-Eclipse. Mr. Flershem continues with the company as vice chairman, a new post.

L. duPont Yager, vice president of Reynolds Aluminum Sales Co., was appointed to direct **Reynolds Metals Co.**'s distributor sales operations, Detroit. He was general manager, Great Lakes sales region, and most recently served in Reynolds' automotive sales at Detroit. Mr. Yager succeeds **William F. Morrow**, who joined Pioneer Aluminum Co. in Los Angeles.

L. Gardner Kreiser was made assistant production control manager, Milwaukee operations, **AC Spark Plug Div.**, General Motors Corp. He was superintendent of gyro manufacturing. **Meril E. Johnson** was made manager of the Washington office of AC Spark Plug's electronics division.

Hugh V. McGuire was made assistant to the sales manager of **Enthone Inc.**, New Haven, Conn. He will specialize in marketing metal finishing equipment and accessories.

Vernon H. Patterson was appointed metallurgical engineer by **Vanadium Corp. of America**, New York. Affiliated with the engineering sales division, he is in Chicago. Mr. Patterson was with Texas Foundries Inc.

Radio Corp. of America appointed **Ralph S. La Montagne** manager of marketing, missile electronics and controls department, RCA Defense Electronic Products, Burlington, Mass.

Robert E. Sperber was appointed assistant to the president, **O. Hommel Co.**, Pittsburgh. He was sales promotion manager, Geometric Stamping Co.

B. D. Claffey was elected a vice president, **Dayton Malleable Iron Co.**, Dayton, Ohio. He is general manager, GHR Div.

John W. Allister joined **Ajax Sheet Metal & Iron Works**, Milwaukee, to head estimating and production planning. He was with Fabricated Metal Products Co.

E. L. Mills was made district manager at Duluth for **Link-Belt Co.** He replaces **R. P. Sayers**, advanced to the Chicago district sales office.

R. O. Wolcott was appointed director of administration, aeronautical division, **Minneapolis - Honeywell Regulator Co.**, Minneapolis.

George J. Papas was appointed vice president-purchasing, **Rheem Mfg. Co.**, Chicago. **Robert G. Belote** was made vice president-industrial relations. Mr. Papas was director of purchasing. They are in New York.

William E. Kennedy was appointed sales manager at the Kenilworth, N. J., plant of **Jones & Laughlin Steel Corp.**'s stainless and strip division. He was general sales manager, Canfield Steel Co., division of Lifetime Products Corp.

Russel H. Meyer was appointed marketing assistant of **Hancock Industries Inc.**, Jackson, Mich. In addition, he will assist in sales of two Michigan manufacturing divisions, Telecontrol and Hancock Mfg.

Albert E. Kornhauser was elected treasurer, **Controls Co. of America**, Schiller Park, Ill. He succeeds **John Ruane**, resigned.

Robert M. Kilgore succeeds the late **Robert B. Sanders** as New York district sales manager of **National Steel Corp.**

William H. White was made Buffalo district sales manager, **Fulton Sylphon Div.**, Robertshaw-Fulton Controls Co.

Frank B. Murray fills the new post of western regional manager for **Murray Mfg. Corp.** at Los Angeles. He was formerly sales engineer for Hoffman Electronics.

Homer D. Sullivan was named Chicago district sales manager for **Plasteel Products Corp.**

J. R. Cornell was appointed acting purchasing agent, boiler division, **Babcock & Wilcox Co.**, at Barberton, Ohio. Former assistant general purchasing agent, he succeeds **W. C. Moulder**, who was named to the staff of **P. H. Setzler**, vice president of the division's manufacturing department.

John M. Walker was elected controller of **Metals & Controls Corp.**, Attleboro, Mass.

D. Gray Slawson was named sales manager of the new industrial di-

STANDARDIZE WITH VERSATILE AMBALLOY STEELS

There are a lot of reasons for standardizing with Amballoy—personalized steels from Byers. The most important is that you *save money*.

Here's how. First: the very versatility of Amballoy enables you to reduce your necessary chemistries to one or two. Second: through heat treating, you can match this metal to your most exacting physical characteristics.

It's an ideal way to increase your "internal revenue." Metal-users who standardize on Amballoy shrink unproductive capital. Their inventories and special handling and processing costs are drastically reduced. There's more to the story. And the Byers metallurgist has it. Let him show you how Amballoy steels can qualify as the workhorse material for your critical applications.

For further information and the name of your Steel Service Center stocking Amballoy, write or call: Manager of Steel Sales, ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

SAVE THROUGH YOUR STEEL SERVICE CENTER

The savings are very real.

Your Steel Service Center is manned, equipped, stocked and located to serve you metal-users at a fraction of what it would cost you to serve yourselves. Consider the advantages, the savings in letting your Steel Service Center distributor carry the vast inventory. Let him meet those 24-hour commitments. Let him do the slitting, flame-cutting, sawing, shearing. Let him pay for the space and manpower to do it.

That's his business. He's an old pro at it. So let him roll with the market's uncertainty. Let his capital, his equipment, his record-keeping assume the brunt of today's high operating costs. Let him process your order for Amballoy steels.

And when you need help in standardizing on the *right* alloys for your requirements, write or call *us:* ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

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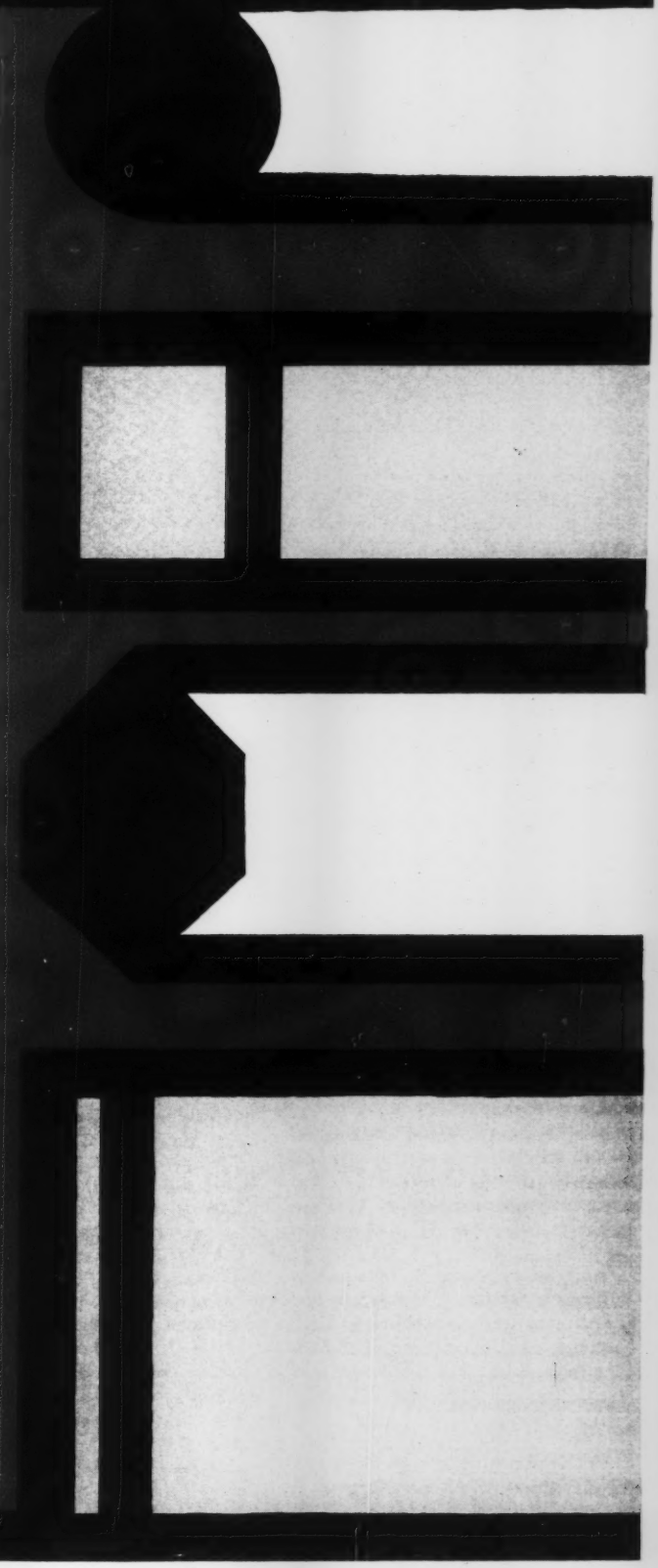
AMBALLOY ELECTRIC FURNACE QUALITY STEELS



ROBERT L. WENDELL
Technical Wire prod. mgr.

N. T. WONSETLER
Truscon production mgr.

MRS. LAURENCE PELLIER
joins Inco research lab

vision of **Haskelite Mfg. Corp.**, Grand Rapids, Mich.

Robert L. Wendell was named production manager of **Technical Wire Products**, Springfield, N. J. **Malcolm S. Pringle** was named treasurer.

Republic Steel Corp.'s **Truscon Div.**, Youngstown, named **N. T. Wonsetler** production manager, and **H. P. Crowley**, superintendent of Departments E and S, where special and standard type windows are produced. For the last five years, Mr. Wonsetler has been assigned to Republic's headquarters in Cleveland to assist in production planning at various company steel plants and manufacturing divisions.

Fred A. Martin was made general sales manager, parts division, Warren, Pa., **Sylvania Electric Products Inc.**

Clarence E. Griese was appointed general sales manager, **Ohio Hoist Mfg. Co.**, Lisbon, Ohio.

Harry F. Isaman was appointed western field engineering representative, **Bendix Industrial Controls Section**, Bendix Aviation Corp., Detroit. He is in Los Angeles.

Eugene H. Nelson was made a district representative, **Koehring Div.**, Koehring Co. His office is in Dallas. Mr. Nelson was a district representative for Parsons Div. at Newton, Iowa.

L. F. Harding, formerly with the Detroit office of **C. O. Bartlett & Snow Co.**, transferred to the Chicago district in charge of sales. He has offices at Oak Park, Ill.

Mrs. Laurence Pellier joins the staff of the research laboratory of **International Nickel Co. Inc.** at Bayonne, N. J. A specialist in the application of electron microscopy to problems of physical metallurgy, Mrs. Pellier becomes a member of the laboratory's physics section. She will study microstructural changes which occur in jet engine and other high temperature alloys subjected to high stresses at high temperatures.

Benny Silvestain was elected treasurer of **Empire Steel Corp.**, Mansfield, Ohio.

James H. Felt was elected secretary of **Acme Steel Co.**, Chicago.

Walter W. Hutchinson was named sales manager, **Cullman Wheel Co.**, Chicago.

Norman J. Kirk was elected president and general manager, **Toledo Pipe Threading Machine Co.**, Toledo, Ohio. For the last ten years, he has been with E. W. Bliss Co., serving as vice president and general manager of its Toledo operations.

Edward J. Martin was made director of purchasing for **Mele Mfg. Co. Inc.**, Utica, N. Y.

Dr. George H. Found joined the engineering division of **Arthur D. Little Inc.**, Cambridge, Mass., as senior staff member. Dr. Found previously was executive vice president and general manager of Saginaw Bay Industries Inc., and vice president of Magline Inc.

William H. Stewart was appointed Philadelphia district manager for Burroughs Corp.'s **ElectroData Div.**

OBITUARIES...

John Sanderson, 67, executive vice president, **Sperry Rand Corp.**, New York, died Dec. 7.

John W. Hodgson, 70, president, **Hodgson Foundry Co.**, Chicago, died Dec. 4.

Clinton H. Crane, 85, retired chairman, **St. Joseph Lead Co.**, New York, died Dec. 1.

Frank C. Farrell, 75, retired manager of the Buffalo plant of **Republic Steel Corp.**, died Dec. 1.

Edward E. Roberts, 53, assistant purchasing agent, **C. O. Bartlett & Snow Co.**, Cleveland, died Nov. 26.

H. J. Johnson, 59, vice president, **Belke Mfg. Co.**, Chicago, died Nov. 28.

Isadore J. Behr, 56, president, **Joseph Behr & Sons Inc.**, Rockford, Ill., died Dec. 2.

Samuel K. Frankel, 48, president, **Elgin Metalformers Corp.**, Elgin, Ill., died Dec. 1.

Bernard T. Roe, vice president, **Federal Enameling & Stamping Co.**, Pittsburgh, died Nov. 27.

Victor H. Lawrence, 61, former general superintendent of the Otis plant in Cleveland for **Jones & Laughlin Steel Corp.**, died Dec. 3 at his home in Allison Park, Pa. He retired three years ago as vice president-industrial relations.

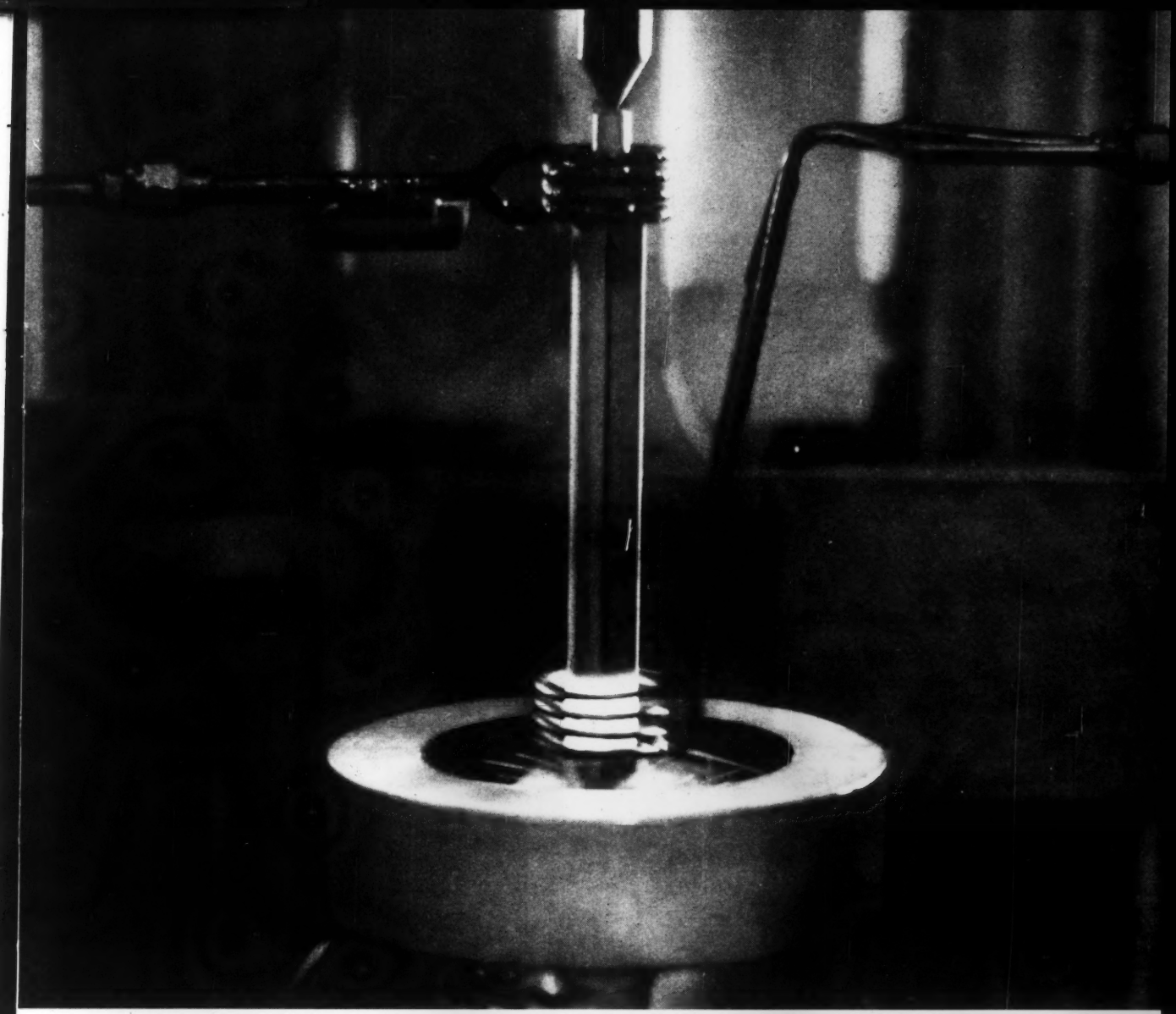
William R. Sorgel, 74, president, **Sorgel Electric Co.**, Milwaukee, died Nov. 27.

Thomas R. Mullen, 65, president, **Lehigh Structural Steel Co.**, Allentown, Pa., died Dec. 2.

George S. Forbes, director of purchases, **Century Electric Co.**, St. Louis, died Nov. 12.

Philip Kerrigan Jr., 54, president, **Kerrigan Iron Works Inc.**, Nashville, Tenn., died Nov. 24.

Thomson Kingsford, 70, general manager, **Kingsford Foundry & Machine Works**, Oswego, N. Y., died Nov. 20.



Ketos shaft being induction hardened to Rockwell 55-56, while ends remain soft for final machining. Photographed at Control Instrument Co., Inc., Brooklyn, N. Y.

KETOS has wide hardening range with minimum volume change...

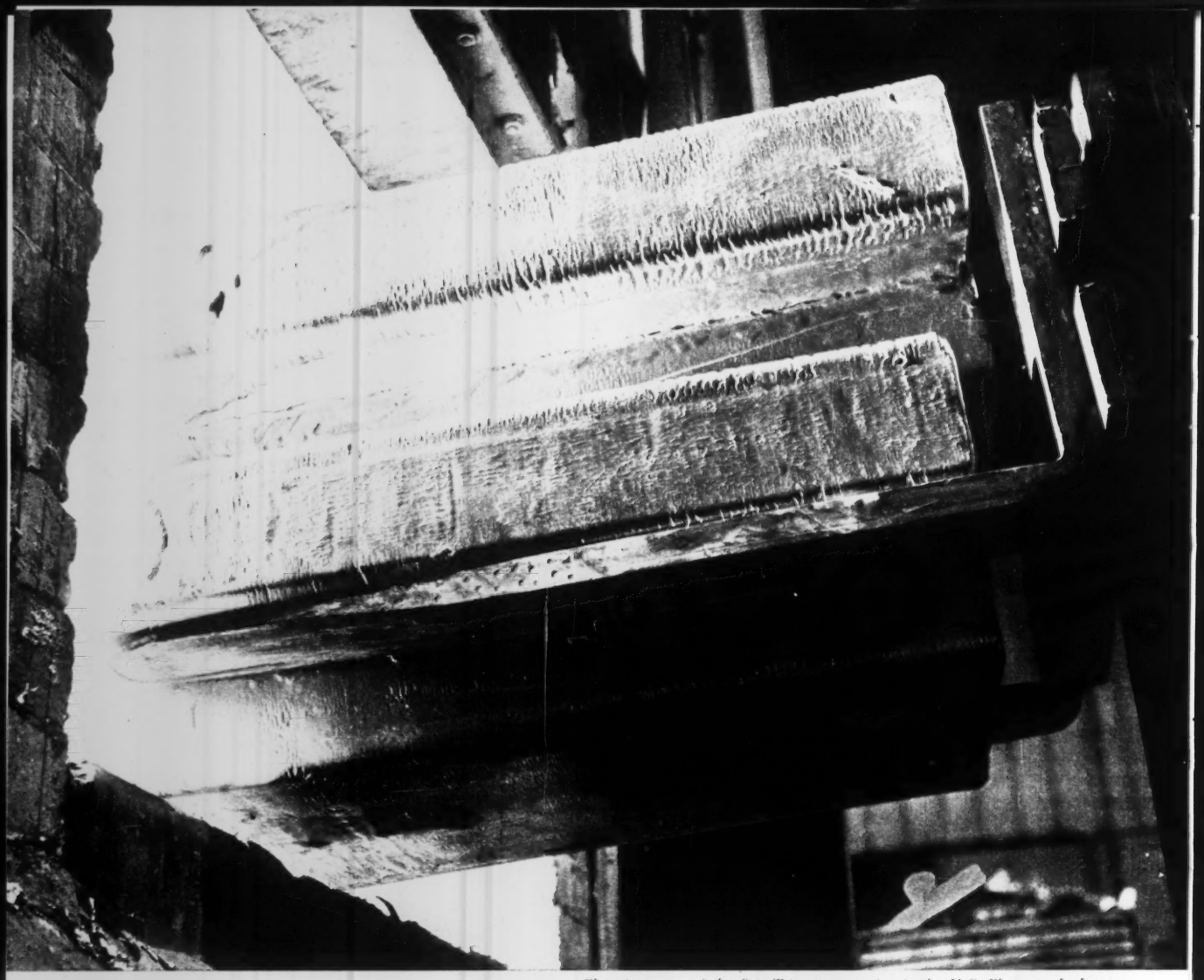
Ketos is a low priced alloy tool steel that can be hardened from low temperatures with practically no volume change. It has deep hardening qualities, and a fine grained structure, that make it desirable for many production parts.

That's why nondeforming Ketos is well suited not only for most tool steel applications such as gauges, dies, and taps but also for close-tolerance, wear-resistant parts like the actuator bar shown in the induction heating unit above. The thin contact edges of this particular part withstood a "life test" of over 4-million high speed blows. No other steel tested lasted more than 1-million cycles before it chipped and failed.

If Ketos sounds like the steel you should be using, call your nearby Crucible warehouse. Stocks of Ketos and dozens of other special tool steels are large, delivery fast. *Crucible Steel Company of America, Dept. TL15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

Canadian Distributor—Railway & Power Engineering Corp., Ltd.



Charging some of the first T-ingots to arrive in the U.S. Photographed at an independent aluminum fabricator – the Kawneer Company, St. Charles, Illinois

To aluminum fabricators...

who value the importance of ingot design

As specialists in the production of high-quality aluminum ingot in almost every shape and form, Aluminium Limited research is constantly seeking ways to improve its ingot products to serve its customers better. Whether your ingot problem is a question of shape . . . dimensional tolerances . . . or alloy composition control, Aluminium Limited's engineers have the know-how to help meet your ingot fabricating or aluminum remelt requirements.

The T-ingot design is one of several recent developments that have brought savings to many customers in the U.S. Available in 750- and 1500-pound sizes, and shaped like a flattened T, these ingots have been specially tailored to speed handling by fork-lift trucks . . . have successfully reduced railcar unloading time up to 50%. Precision formed, T-ingots stack compactly, up to 10 high, with greatly improved stability. For information about the T-ingot or aluminum in any other ingot form, call or write the nearest office of Aluminium Limited Sales, Inc.

Aluminium Limited

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American Aluminum Fabricators

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Additional distribution (Alcan Foundry Alloys):
Apex Smelting Company, Chicago, Cleveland, Los Angeles
Charles Batchelder & Company, Botsford, Conn.

See Omnibus . . . alternate Sundays, NBC-TV, 5-6 P. M., EST

More Companies Try Leasing

Conference Board reports that one-third of the firms it surveyed are renting more equipment and facilities now than they did five years ago. Six advantages are cited

YOU CAN conserve working capital by renting needed equipment or facilities: That was the chief purpose for leasing listed by 221 manufacturers surveyed by the National Industrial Conference Board.

Some companies favor renting because it:

- Provides convenience and flexibility.
- Offers short term use.
- Helps avoid obsolescence.
- Simplifies the disposal of unneeded units.
- Eliminates maintenance problems.
- Offers certain tax advantages.

• **More Rentals**—About one-third of the companies surveyed reported that they rent more equipment and facilities than they did five years ago. Of the remaining two-thirds, 110 rent the same amount, and 33 did not respond. Seven companies indicated a decrease.

Warehouses, office equipment, automobiles, and trucks contributed to the increase. Car and truck rentals showed the greatest gain in the last five years. Though production machinery and machine tool rentals have picked up, they remain a small part of the volume.

The companies reported that it is sometimes advantageous to rent buildings to obtain desirable locations not available for purchase. Other factors: A move is easier to make when a site deteriorates, and if consolidation of plants is in the books, rented buildings might provide good temporary facilities.

• **Drawbacks**—Three general deterrents to the growth of rental practices were reported to the NICB. They are: Relatively high prices which many lessors impose as a safeguard against the hazards and added expenses of lease selling; more liberal depreciation allowances on owned property; and the uncertainty of potential tax benefits under certain leasing arrangements.

Products suitable for leasing are manufactured by 127 of the surveyed companies. Of those, 30 are already offering their products on a rental basis, and ten are considering the practice.

Nickel Firm Changes Name

Cuban American Nickel Co., a subsidiary of Freeport Sulphur Co., New York, changed its name to Freeport Nickel Co. The firm will operate a nickel and cobalt refinery at Port Nickel, La. To supply the refinery, Freeport Nickel's subsidiary, Moa Bay Mining Co., will mine and concentrate ores at Moa Bay, Oriente Province, Cuba. Beginning in the summer of 1959, Freeport will produce 50 million lb of nickel and 4.4 million lb of cobalt a year.

Enlarges Steel Stocks

Calbag Steel Warehouse Co. has established a $750,000 service center at 3441 N.W. Guam, Portland, Oreg. With an additional 140,000 sq ft of floor area, the company has stocked 7000 tons of steel since mid-October when the facility was opened. It expects to increase the total to 11,000 tons within the next few months. The company's scrap and nonferrous metal operations will continue in quarters at 2495 N.W. Nicolai St., Portland.

Forms Industrial Park

Washington-Rockville Industrial Park, a planned science industry center, has been established in Montgomery County, Maryland, to meet the needs of science-oriented industries seeking accommodations at the nation's capital. Many new companies have located in the area and some of the older firms have established branch offices there. Advantages claimed for the site include proximity to key government agencies; large research facilities; high concentration of scientific, engineering, and administrative personnel; and the strong marketing position of the national capital. A survey of the metalworking industry is being made to develop statistical data on site and building requirements to meet specific needs of companies in that industry.

Oxygen Steelmaking Gains

An oxygen steelmaking plant has gone into production at Sault Ste. Marie, Ont., as part of Algoma Steel Corp.'s expansion program. The two oxygen steel furnaces, rated at 60 tons each, will operate on a rotation basis, each producing more than 200 heats before needing a relining.

Installs Brazing Facility

Meridian Metalcraft Inc., Whittier, Calif., constructed a new, aluminum dip brazing installation which is equipped for quantity production of aluminum assemblies, including the large sizes used in aircraft and missiles. The main brazing tank measures 36 x 36 x 60 in. in depth.

Builds $9 Million Plant

Gates Rubber Co., Denver, is constructing a $9 million manufacturing plant at Nashville, Tenn. The building will contain more than 500,000 sq ft of floor space and will house equipment to make tires. The firm expects to add facilities to make other products later.

Dedicates Research Center

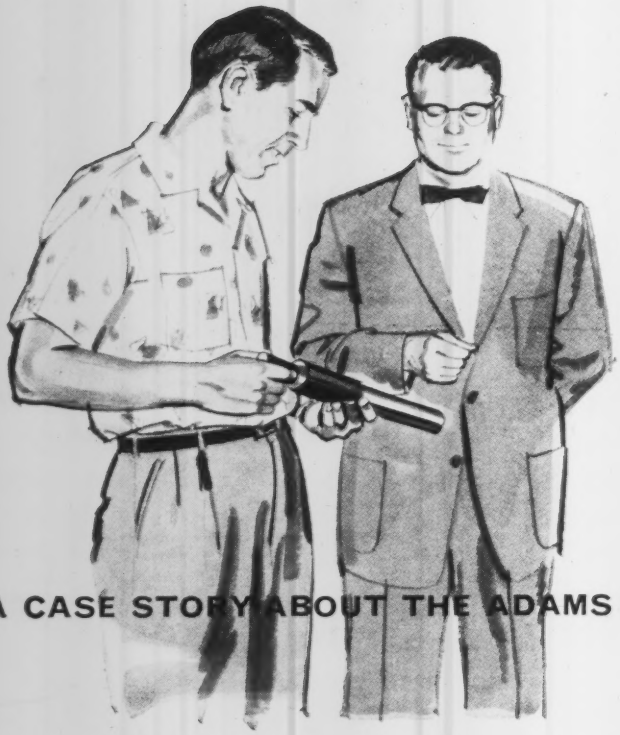
General Electric Co.'s Lamp Div. dedicated its $5 million lamp research center at Nela Park, Cleveland. Carl L. Olson, manager, says this marks the launching of an intensive pure research program aimed at "advancing the frontiers of knowledge of light production and its effect on all living things." The center houses three distinct research and engineering laboratories. The lamp research laboratory under the direction of John S. Saby is in-

(*Please turn to Page* 116)

Bob showed them a new product that ended rust on work and tools—

STANDARD Special Transparent Coolant

A CASE STORY ABOUT THE ADAMS COMPANY, DUBUQUE, IOWA



Before Standard Oil lubrication specialist Bob Wenger told The Adams Company management about Standard's SPECIAL TRANSPARENT COOLANT, there had been considerable trouble with rusting of work and machines in the plant. There had also been trouble with deposits on the ways of the grinding machines. Rust occurring on parts being processed was resulting in damage and even losses. All of this has been changed.

"Since we changed to your SPECIAL TRANSPARENT COOLANT, we have not had any rusting or deposits on our machine tools, and this product has eliminated the rusting problem on parts being processed through our plant," says Harlow Adams, president of the company.

The Adams Company found they received important additional benefits as well. Operators could now see their work clearly. There was less wheel loading. Because the coolant didn't foam, more of it stayed on the wheel resulting in cooler operation. Faster cuts were obtained with finer wheels. Finer wheels gave better finishes. Periods between dressings were extended. Work ran cooler and tolerances were maintained.

Research, development and more than two years of field testing have gone into Standard's SPECIAL TRANSPARENT COOLANT. This is the pay-out to you on the research done by Standard Oil to bring you better metalworking products. Find out more about Standard's SPECIAL TRANSPARENT COOLANT. Call your nearby Standard Oil lubrication specialist in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

Bob Wenger (right), Standard Oil lubrication specialist, and John Charles Uthe, grinding room foreman, inspect grinding operation which uses new Standard's SPECIAL TRANSPARENT COOLANT. Bob Wenger is well qualified to go into the shop and make lubrication recommendations. He has been doing this sort of work for nine years. He has an engineering degree from Iowa State College and, in addition, has completed the Standard Oil Sales Engineering School.

Quick facts about

Special Transparent Coolant

- Clear, transparent fluid.
- Able to control corrosion and rust on work and machines.
- All chemical. Does not support bacteria growth.
- Unaffected by humidity.
- Nonfoaming.
- Fire resistant.
- Odorless.

You expect more from **STANDARD** *and get it!*

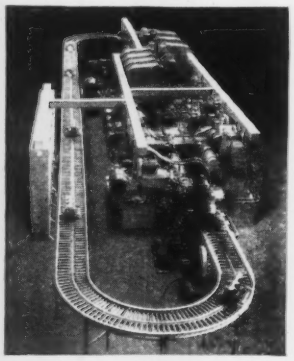
No rust. Shaft ground with Standard's SPECIAL TRANSPARENT COOLANT shows no rust on inspection by A. T. Murphy, General Superintendent, Harlow Adams, President, and Bob Wenger, Standard Oil lubrication specialist.

STEEL from Wheelock, Lovejoy BULLETIN

W-L DETROIT For the first time, HY-TEN D-2 air hardening steel now available here in rounds, squares, flats and billets. Also a fine stock of standard alloy grades, especially A-8620, as well as all HY-TEN grades. Excellent service from our new warehouse.

W-L CHICAGO Steady demand for "B" No. 3X for flame-hardened parts such as boring bars. Good stocks of HY-TEN AIS the best carburizing alloy steel, and freest machining available today—a new W-L exclusive!

W-L CINCINNATI This 23-station Avey Line-O-Dex transfer machine, designed and built by The Avey Division of Motch & Merryweather Machinery Co., Cincinnati, Ohio, is equipped with spindles made of our HY-TEN "B" No. 2. This grade was chosen for its great tensile strength (100,000 P. S. I. in the natural condition), toughness, and fine wearing qualities.



W-L CAMBRIDGE We are now distributing FLEXANGLE, the easy-to-erect structure assembly for all types of racks, shelves, platforms, etc. It's completely universal and low in cost—can be used anywhere, by anyone, for any storage purpose.

W-L HILLSIDE Our stock of flat and square sizes in HY-TEN M Temper Oil Hardening Steel can save you time and money in your tooling program. HY-TEN "B" No. 3X pre-heat treated in rounds, squares and flats available in a wide range of sizes. Billets on hand for hammer forging in all grades of HY-TEN.

W-L CLEVELAND Excellent stock of brake die flats and squares. Also many sizes up to 16" x 18" in HY-TEN Mold Steel. Excellent deliveries.

W-L BUFFALO A wide range of rounds and hexagons in cold drawn AISI leaded and non-leaded A-4140. Also many sizes of the new "B" No. 3X-40 in rounds and hexagons.

Write our Cambridge office today for your *free* Wheelock, Lovejoy Data Sheets. They'll give you complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK, LOVEJOY & COMPANY, INC.
132 Sidney Street, Cambridge 39, Mass.

AMERICAN STEEL WAREHOUSE ASS'N

AGENTS: Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto

(*Continued from Page 113*)

volved chiefly in investigation into chemical and physical processes which give off light. The lamp engineering research laboratory under the direction of D. E. Elmendorf is concerned with the interpretation of scientific research findings and translating them into sound engineering practices. The radiant energy effects laboratory under the direction of S. K. Guth is engaged in the investigation of the effects of light on man, plants, and animals.

Metal Stamper Expanding

American Forging & Socket Co., Pontiac, Mich., which recently became a unit of United Industrial Syndicate Inc., New York, is expanding its operations as a supplier of pressed metal stampings and assemblies to the automotive industry. Officers are: President and general manager, G. H. Rogers; vice president, W. H. Graves; secretary, E. F. Barrett; and treasurer, Harry B. Frazier.

Brush Beryllium Expands

Brush Beryllium Co., Cleveland, is expanding its rolling mill facilities at its Elmore, Ohio, plant. A building will be constructed to house additional cold strip mill facilities, additional machining capacity for billet and slab milling, and a major expansion of annealing facilities. Brush also will modify its present hot mill to permit rolling of wider beryllium sheets and provide additional facilities for the finishing operations on beryllium metal sheets. Cost of the program: $250,000.

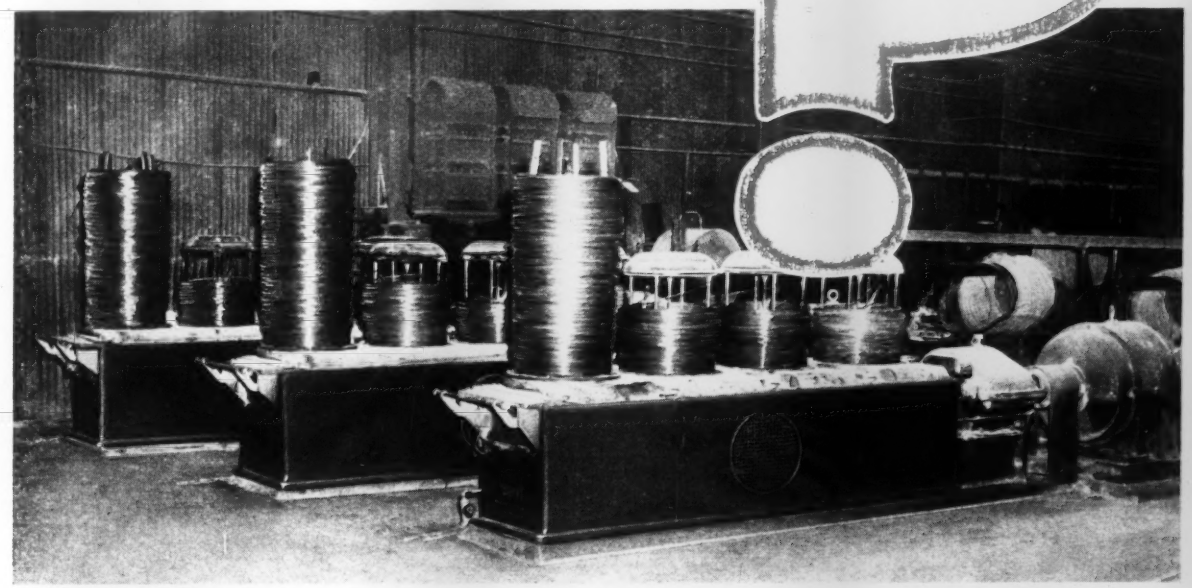
Rheem Moves Product Line

Rheem Mfg. Co., Chicago, will transfer steel shipping container production from Sparrows Point, Md., to its container plant at Linden, N. J. Rheem will continue to make home product items, including automatic storage water heaters, at Sparrows Point.

Builds Plant in Indiana

May is the target date for completion of Brown Trailers Inc.'s $1.5 million plant at Michigan City, Ind. The firm is a division of Clark

want **BIG** *bundle capacity*



. . . then try **MORGAN-CONNOR** wire machines. The Morgan-Connor Machine is a nonslip, continuous, dry wire drawing machine. Morgan machines will give you maximum weight bundles at the lowest possible cost.

MORGAN WORCESTER

MORGAN-CONNOR
WIRE MACHINES

WM 110

MORGAN CONSTRUCTION COMPANY WORCESTER, MASS.

ROLLING MILLS • MORGOIL BEARINGS • WIRE MILLS • REGENERATIVE FURNACE CONTROL • EJECTORS • GAS PRODUCERS

S. S. Rickley, Representative, 300 Cedar Blvd., Pittsburgh, Pennsylvania

Charlie Miller, Purchasing Agent, The American Welding and Manufacturing Co., Warren, Ohio, tells:

How a G-E vacuum-melted alloy helped solve the problem of fabricating super-hard jet engine rings

"At American Welding it's our business to make jet engine components to exacting specifications. Some of the materials we use are difficult to fabricate. René 41 is a case in point. We were getting many rejects on rings of this material, making it hard to meet delivery schedules.

"In looking for a solution to this problem, we placed an order with the Metallurgical Products Department of General Electric. We felt that G.E., with more than 10 years' experience in vacuum-melted alloys, could help us . . . and they did. They supplied us with vacuum-melted René 41 that met high physical and mechanical specifications. Fabrication problems were quickly solved by our metallurgical and production men with assistance from G-E metallurgical engineers.

"Now we are delivering these precision jet engine rings on schedule . . . and rejects have been practically eliminated."

Whatever vacuum-melted alloys your specifications call for, you too can profit from General Electric's leadership in this field. For facts about the complete G-E vacuum-melting service and facilities write: *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Street, Detroit 32, Michigan.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

Equipment Co., Buchanan, Mich. Brown is increasing production of aluminum trucktrailers and cargo van bodies and will produce a new line of all-steel and steel-aluminum trailers. It will close its plant in Elgin, Ill., when operations begin in the new facility. Other plants are in Spokane, Wash., and Reading, Pa.

CONSOLIDATIONS

Gate City Steel Inc., Denver, purchased **Moffett Engineering Inc.**, Albany, Calif., designer and builder of cranes. Gate City Steel is a subsidiary of Husky Oil Co., Cody, Wyo.

Hammond Valve Corp., a subsidiary of Consolidated Diesel Electric Corp., Stamford, Conn., is purchasing **Hammond Brass Works Inc.**, Hammond, Ind., maker of bronze valves.

Heifred Co. purchased **Hustler Corp.**, producer of electric lift trucks. Both firms are in Willoughby, Ohio. Management of the consolidated firm, Heifred Corp., is headed by Henry Hein and Zigmund Fredericks.

Topp Industries Inc., Los Angeles, is acquiring **U. S. Semiconductor Products Inc.** and **U. S. Electronics Development Corp.**, both of Phoenix, Ariz. The affiliate companies make diodes and other semiconductor devices, tantalum capacitors, and basic silicon materials for infrared applications.

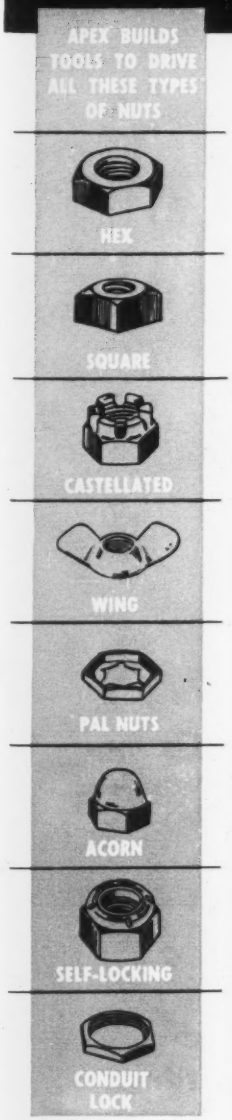
Turbo Dynamics Corp., Los Angeles, acquired **Huber Tool Works Inc.**, San Carlos, Calif. Dr. W. O. Davis, a nuclear physicist, will manage the Huber plant which produces electronic components, gages, and other equipment for the electronics industry.

NEW PLANTS

Metal Stamping & Processing Co. has completed a $225,000 plant at 3900 12th Ave. N., Birmingham,

(*Please turn to Page* 122)

everything you need
to fasten anything with nuts



APEX

NUT RUNNING TOOLS

IF you run down thousands of nuts every day, or just a few —

IF you use one size or several sizes of nuts —

IF you use hex, square, self-locking, castellated or any other kind of nuts —

IF you work with brass aluminum, stainless steel, monel, bronze, nickel alloy nuts, or any type of special fasteners —

IF you use manual or power tools, or even multiple units to run down nuts —

THEN you can certainly use Apex standard or magnetic nut running tools specifically designed for your nut running work. For most applications, simply select the correct Apex tool from more than 5,000 stock types and sizes. For special applications, just ask Apex — the authority on fastening — for practical assistance in solving your problem.

Write, on your company letterhead please, for Catalog 30-A (tools up to 5/8" drive), or Catalog 30-B (tools 3/4" drive and larger).

1933 *A Quarter Century of Service to Industry* 1958

THE APEX MACHINE & TOOL CO.
1032 S. Patterson Blvd.
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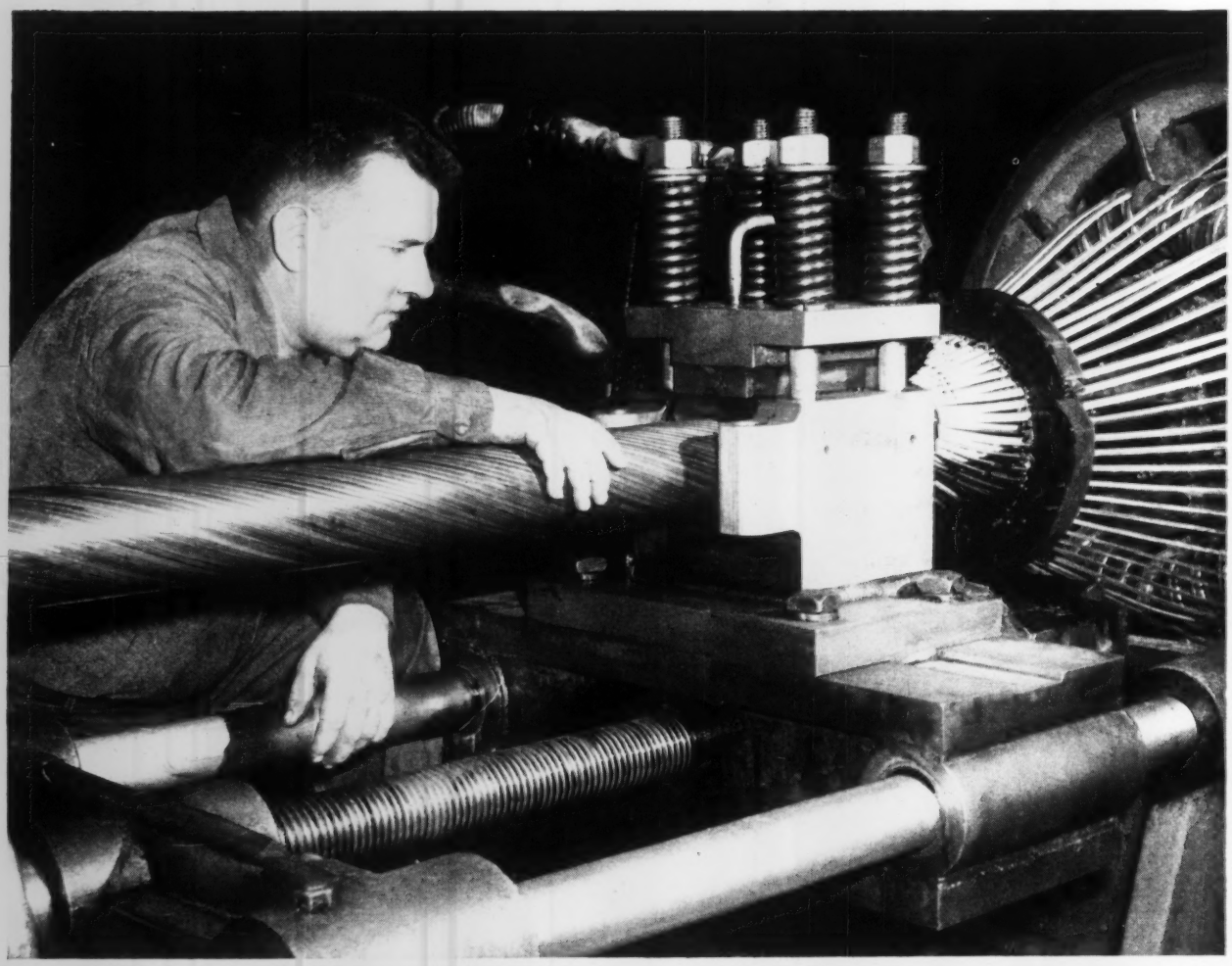
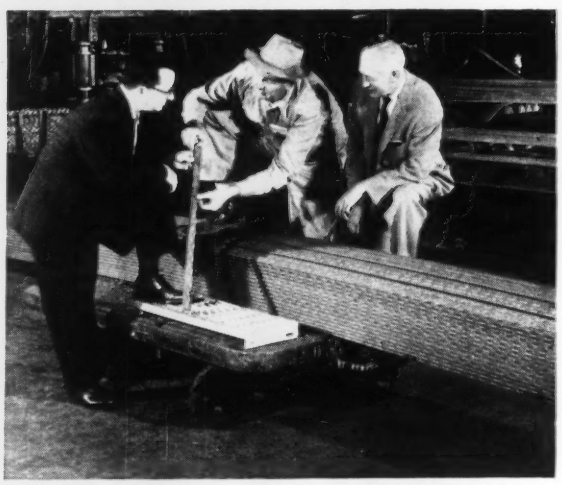
TOOLS FOR
screwdriving
nut running
FASTENING

When you buy from U. S. Steel



STEEL + PLUS IN ACTION: FACILITIES

You're looking at the largest lock-coil cable in the world. It was specially designed and built by U.S.Steel's American Steel & Wire Division for the main tramway used in construction of the Glen Canyon Dam in Arizona. Construction crews have nicknamed it "the main gut," because it will carry the concrete and steel that are placed in the dam. The cable is four inches in diameter, has 312 individual steel wires and weighs 38 lbs. per foot. It took complete manufacturing facilities and know-how to produce this unique construction link.



STEEL + PLUS IN ACTION: TECHNICAL ASSISTANCE

When Blaw Knox Company made nose plates for open-grate stair tread, they cut sections from flat plates and bent them into shape —an operation that often cracked the plates and left them for scrap. U.S.Steel offered a special angle section with a raised tread *already rolled* on the top side. This eliminated shearing and forming operations and stopped the scrap waste. The new nose plates are simply cut to length and welded to the grate—at a substantial saving in fabrication and steel costs.

you get STEEL + PLUS

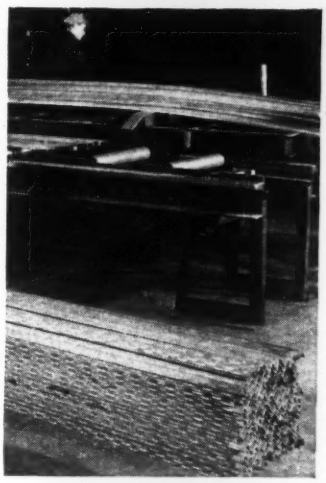
STEEL + PLUS IN ACTION: MARKETING ASSISTANCE

Sales of major appliances were never very high during the Christmas selling season—until 1954 when U.S. Steel launched the first annual Snowflake promotion. Since then, Christmas-time appliance sales activity has climbed steadily as a result of this newspaper, magazine, radio, and TV campaign to promote major appliances as Christmas gifts. Hundreds of retailers and manufacturers have used the Snowflake campaign as a master plan. They built their own promotion program around it, using sales kits and aids provided free by U.S.Steel.

STEEL + PLUS IN ACTION: RESEARCH

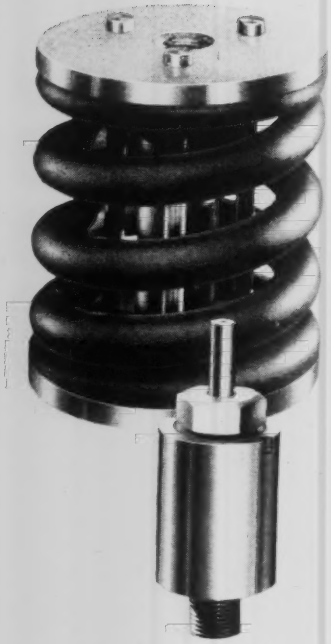
With an electrical current, this emission spectrograph vaporizes samples of metal. The emitted light spectrum is analyzed to reveal the exact amount of the important elements present in the sample. This type of test on the strip used for tinplate helps U.S.Steel research teams maintain the consistent high quality of tinplate, and guarantees top protection for products packed in steel cans.

USS is a registered trademark



American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel
National Tube • Oil Well Supply • Tennessee Coal & Iron • United States Steel Homes • United States Steel Products
United States Steel Supply and Gerrard Steel Strapping • Universal Atlas Cement • United States Steel Export Company

USS United States Steel



Ordinary spring and Strippit Hydra-Spring of equivalent force.

equal stripping power in 1/6 the space

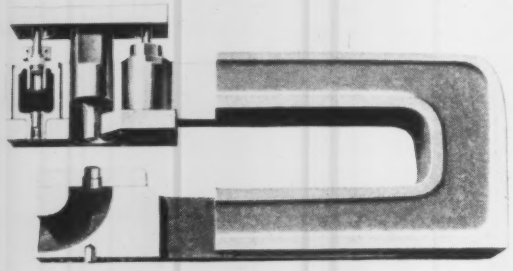
to cut your heavy-duty tooling costs!

Where high stripping pressures are required due to size and type of work or thickness of stock, Strippit Hydra-Springs are the answer. Utilizing the compressibility of liquids, Hydra-Springs develop up to six times the force of equivalent mechanical springs, greatly reducing the number, travel and size of stripping units required.

Impressive economies through Strippit flexible multiple-unit press setups

Like the Strippit, the Hydra-Spring is used in the Strippit line of independent, self-contained, self-stripping punching units. This is the tooling system that breaks the time and cost barriers of fixed perforating dies by permitting simple bench assembly setups . . . all but eliminating press down-time whether it's a long production run, a pilot run for design changes or a "repeat" run later on. No burring necessary, of course.

WHATEVER YOUR PIERCING OR NOTCHING APPLICATION, don't miss the major savings so many industries are enjoying with flexible Strippit tooling. Write today for full details, and if you wish, a demonstration at your plant by a mobile Strippit unit.



Using Hydra-Springs for the heaviest duty work, the Strippit line of hole punching units offers a complete range of capacities up to ¾" in mild steel. A full stock of quick-change standard tools or "specials" made to your order. Warehouse stocks in Chicago and Los Angeles.

WALES STRIPPIT COMPANY
210 Buell Road • Akron, New York

UNIT OF HOUDAILLE INDUSTRIES INC

Manufactured in Canada by Strippit Tool and Machine Limited, Brampton, Ontario

(*Continued from Page 119*)

Ala. It has 15,000 sq ft of floor space. Construction of an office building is nearing completion. Plant facilities include high speed slitting machinery capable of cutting steel coils weighing up to 40,000 lb, decoiling, leveling, and edging equipment. The company was organized by Ferro-Alloy Corp., Chicago, and Metal Stamping Co., Birmingham. Robert F. Comer is president.

Hanchett Mfg. Co., Big Rapids, Mich., and Portland, Oreg., constructed a branch factory, office, and warehouse at Fifth Avenue S and 31st Street, Birmingham, Ala. The firm makes grinders, saw sharpeners and swages, and swage shapers.

Canadian Canners Ltd., Hamilton, Ont., is constructing a can manufacturing plant at Burlington, Ont. It will be completed by March and should be in partial operation for the 1959 packing season beginning in June.

Pneumafil Corp., steel and nonferrous metal fabricator, has leased 35,000 sq ft of space in the former Kendall Mills plant in Thrift, N. C., to expand its production facilities. Operations will be continued at its present plant in Charlotte, N. C.

Alabama Metallurgical Corp., jointly owned by Calumet & Hecla Inc., Chicago, and Brooks & Perkins Inc., Detroit, has started work on the site for its $3.5 million magnesium plant near Selma, Ala. It will have an initial capacity of 6000 tons a year. The metal will be produced from dolomite mined from a company owned deposit at Ryan, Ala.

NEW OFFICES

Jones & Laughlin Steel Corp., Pittsburgh, opened a resident sales office at 108 Arlen Bldg., Midland, Tex. The office is under the direction of D. M. Griffith, Houston district sales manager.

Detroit Steel Corp., Detroit, opened a district sales office at 3700 East Ave., Rochester 18, N. Y. R. S. Cummins, manager of sales, is in charge. The firm also opened a Mil-

"Sweet little money-maker... before we put the wheels on!"

Funny joke! But the boss is not amused.

His company supplies the body of that cart to other manufacturers — successfully, too. Just recently he decided to market a model of his own, complete with wheels. Yes . . . they're selling fast. But the company's losing money on every shipment.

What happened? With late and inadequate cost reports on that wheel assembly, the price was set too low. Weeks passed before the boss found out. And it'll be weeks more before his profits stop taking a licking.

How different with Automatic Keysort punched-card controls! With Keysort's meaningful *on-time* job-cost summaries, management would have known how costs were running at every stage . . . could have acted *fast* to keep them in line. Thus, price could have been set to *cover* cost . . . and the new product marketed with a healthy profit included.

Automatic Keysort is today's only data processing system that provides automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system employs simplified machines and methods which can relieve your personnel from many routine clerical functions.

With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. At remarkably low cost . . . without restrictive, complex procedures . . . without specialized personnel.

Call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2.

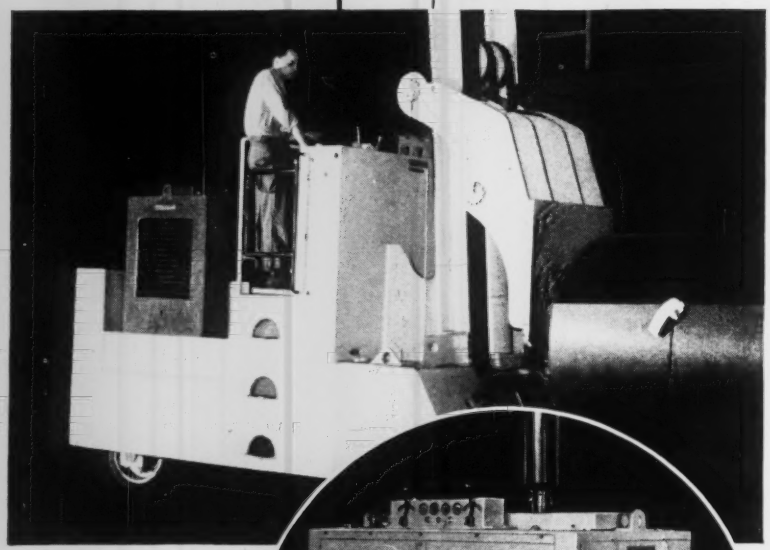
ROYAL McBEE · *data processing division*

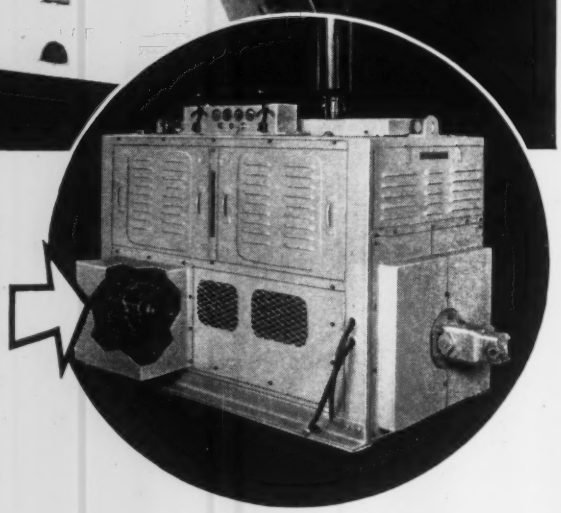
NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

New Diesel-Electric "Power-Package" Does Both Jobs Economically

1 GENERATES TRUCK MOTIVE POWER

2 DIRECT-DRIVES HYDRAULIC PUMP





Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air-Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks

waukee sales office at 8531 W. Capitol Dr. W. V. McClelland, customer representative, is in charge. Richard E. McCabe has been promoted from sales representative to manager of sales, Grand Rapids, Mich., district sales office.

Arnold Engineering Co., Marengo, Ill., formed a new Ohio-area sales district with headquarters in the Carew Tower, Cincinnati, Ohio. District manager is A. L. Snyder. The firm also established a sales engineering office at 8905 Lake Ave., Cleveland, Ohio. James Borst is in charge. The company makes magnetic materials for industry.

Alvey-Ferguson Co., Cincinnati, opened a direct factory branch office in Philadelphia. It's under the management of James R. Keogh Jr. The firm makes conveying systems and equipment.

NEW ADDRESSES

Beryllium Corp., Reading, Pa., moved its Detroit sales office and warehouse to 5649 Van Born Court, Dearborn, Mich. Dale J. Richards is district sales manager.

W. L. Maxson Corp., New York, moved its Instruments Div. to 475 Tenth Ave., New York 18, N. Y.

Sherman Car Wash Equipment Co. moved its plant and offices from Detroit to Broad Street and Public Road, Palmyra, N. J. F. W. Thacher Jr. is president and general manager.

ASSOCIATIONS

Society of Aircraft Materials & Process Engineers is being formed to meet some of the requirements of the Space Age. Temporary officers of the Eastern Division, are: President, G. E. Holback, Martin Co., Baltimore; vice president, T. P. Pajak, Narmco Industries Inc., Womelsdorf, Pa.; secretary, Jay M. Stevens, Bureau of Aeronautics, Washington; treasurer, John S. Thorpe, Allegheny Ludlum Steel Corp., Pittsburgh. Membership will include engineering personnel of the aircraft and missile industries and companies serving these industries.

Spring Steel

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for the

uniform behavior

you require

in fabrication!

in service!

Uniform, dependable response to your manufacturing processes and subsequent service requirements is outstanding in SUPERIOR Spring Steel. We build uniform behavior into every coil, from specified analysis of composition to final anneal before shipment. We're strip steel specialists: *you gain by it.* Specify SUPERIOR for your spring steel needs!

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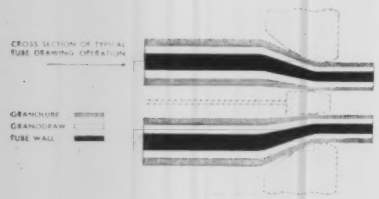
CHEMICAL CONVERSION COATINGS and their functions in facilitating the cold mechanical deformation of metals

By ARTHUR DAHL, Product Development Dept., AMCHEM PRODUCTS, INC.

When used to facilitate the cold mechanical deformation of metals (in drawing, extrusion, stamping, cold heading, necking, and upsetting operations) chemical conversion coatings in conjunction with suitable lubricants perform three important functions. One, they prevent metal-to-metal contact between work and tool. Two, they prevent galling and seizing. Three, they protect stock indefinitely, permitting the storage of in-process work at any stage of production, without danger of corrosion damage.



Characteristic of the tightly bound, highly absorptive, crystalline coating formed by the processes is the ability of the coating to retain lubricity throughout forming operations when treated with a suitable lubricant. This offers the following production advantages:

- Higher degree of reduction
- Greater speed of draw
- Longer tool life
- Fewer process anneals and pickling
- Finer surface finish
- Cleaner mills
- Easier inspection of finished product

Also of interest to production men is the exact duplication of coatings from batch to batch. And the processes are much simpler than other methods of coating metals—baths can be set up and running in less time than it takes to determine suitable coatings by other methods.

TYPES OF COATINGS AND THE METALS FOR WHICH THEY ARE DESIGNED

Zinc phosphate coatings for carbon steel. These coatings can be applied by either dip or spray systems.

Dip. ACP Granodraw No. 1 is typical of the dip process. The sequence includes precleaning, water rinse, pickling, water rinse, water rinse, Granodraw No. 1 solution, water rinse, and a hot neutralizing rinse. Surfaces to be treated must be free of oil, grease, rust and scale. The above sequence insures that they will be. And when metal is free of rust and scale, the pickling bath and two succeeding water rinses can be omitted. In either case, a lubricant like ACP Granolube or conventional lubricant must be applied prior to working the metal.

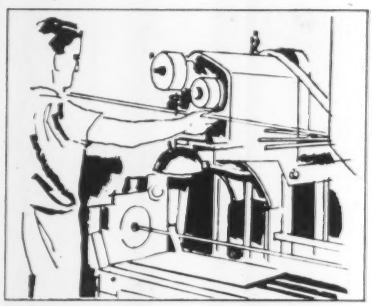
Spray. ACP Granodraw No. 4 is an example of the spray process. It usually requires 5-stage equipment and includes the following steps: precleaning, water rinse, Granodraw No. 4 solution, water rinse, lubricant. After chemical treatment, the work must be dried before forming.

Oxalate Coatings for the stainless steels and many of the high nickel alloys. These coatings are applied only by immersion process, and usually in a 5-stage system which includes an acid pickling or depassivating bath, a water rinse, the ACP Granodraw SS coating bath, a hot borax neutralizing rinse for wire stock, or a lubricating bath for tube stock. Since thorough activation of the metal surface is necessary to promote an adherent coating, the pickling and activating bath is an important stage in processing.

Fluoride-type coatings for zirconium and its alloys. Granodraw ZR is such a coating. It is applied in an immersion process which includes precleaning, water rinse, pickling, water rinse, Granodraw ZR solution, water rinse, drying or lubricating. It has been used primarily in the treatment of stock prior to wire drawing and tube drawing. Surfaces are cleaned of oil and grease by solvent degreasing or alkali cleaning. Pickling is required to provide a surface that is chemically and metallurgically receptive to the coating.

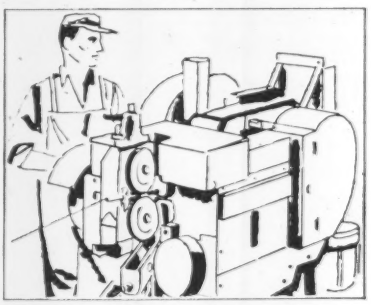
Strong alkali coatings for tantalum and amorphous phosphate coatings for aluminum. These two types of coatings are now in the development stage. Laboratory and field tests are being conducted, results are being evaluated, and modifications in chemical makeup and process sequence are being made to meet requirements. Several field tests, however, have indicated that they will do the same job for tantalum and aluminum processors as the other types of coatings have done for those working carbon steel, stainless steel, high-nickel alloy, and zirconium.

For more information write us at Ambler.

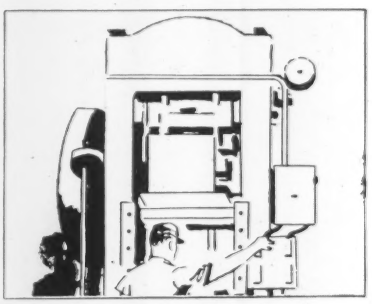


Tube Drawing

Wire Drawing



Cold Heading



Impact Extrusion

Amchem Products, Inc. Ambler 19, Pa.

Formerly AMERICAN CHEMICAL PAINT COMPANY

CHEMICALS ACP PROCESSES

DETROIT, MICH. • ST. JOSEPH, MO.
NILES, CALIF. • WINDSOR, ONT.

New Chemical Horizons for Industry and Agriculture

MACHINING TIPS— Have trouble keeping long run machined parts within size limits, or maintaining surface finish tolerances? A study at the University of Michigan shows that size is influenced by tool feeding forces, which may rise some 20 times during a normal run of parts on automatic screw machines. Surface quality is a function of nonuniform tool wear. The findings mean that you can't predict performance with a brief, sharp-tool test. Also, they support the practice of a close watch for tool wear—a fast tool change before extreme wear occurs.

NOW IT'S PLASMA POWER— Metal strips separated by ionized gas (called plasma) produce electricity when heated, say research people at the University of California. The idea is a takeoff on thermocouples. Potential efficiency is around 30 per cent. At first, they'll be used with nuclear powerplants.

NEW GOALS FOR METALS—High temperature curiosity is undiminished. Many laboratories report they're designing equipment to test physical reactions at 3000° F.

ULTRASONIC SEAM WELDING— Westinghouse has an experimental device that fuses metals with high frequency sound waves. These advantages are claimed: No electric current is applied to the parts; no cleaning or surface preparation is needed; dissimilar metals are easily joined. Dr. C. E. Arntzen, department manager, says that it shows "real promise of being a practical, production technique."

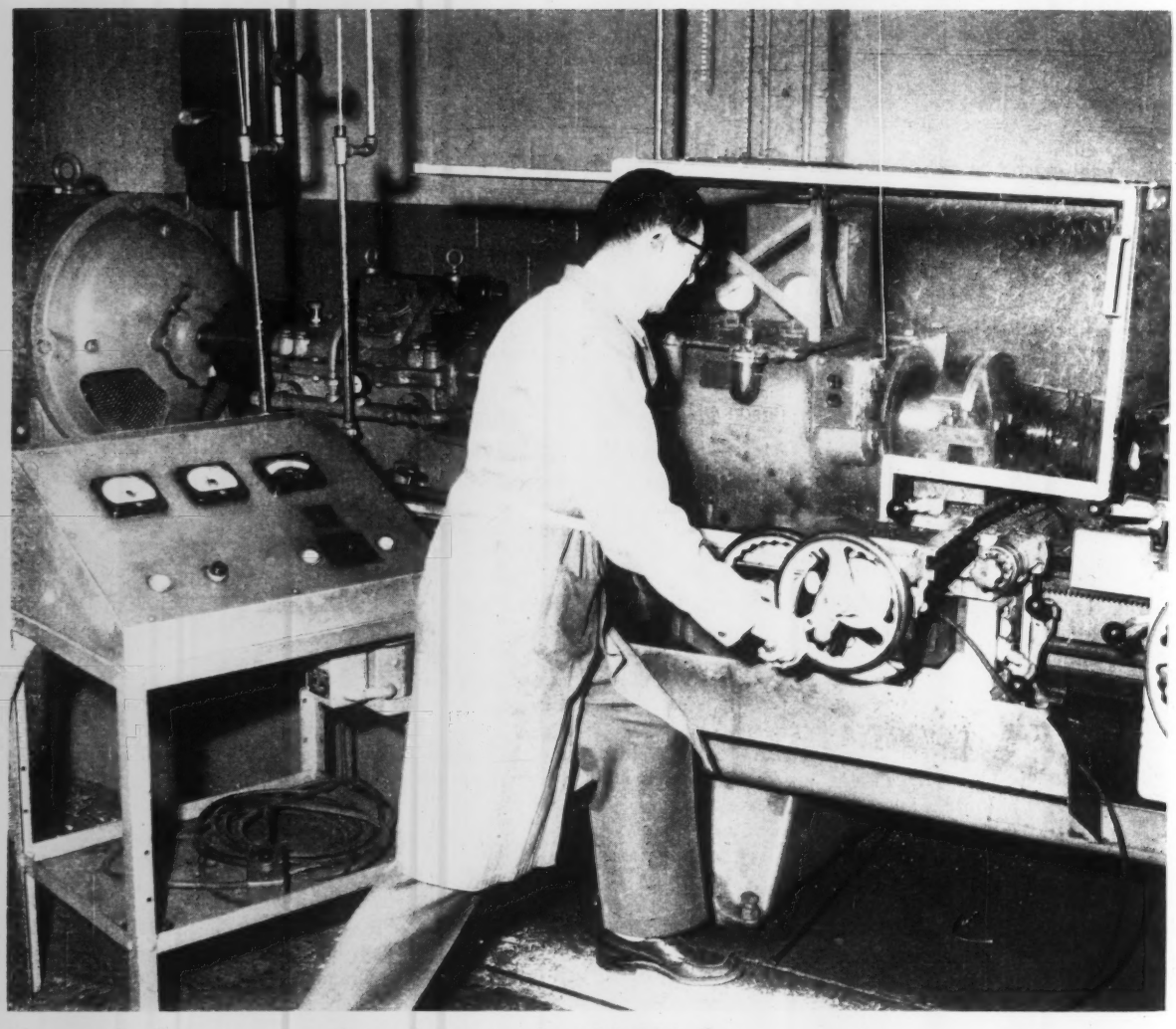
AEC WATCHDOG—Fabricators of atomic fuel elements, reprocessors of enriched scrap, and those who convert uranium hexafluoride to oxide and metal now must maintain special alarm systems to check the accidental accumulation of harmful amounts of radioactivity. It is possible, although unlikely, say atomic energy commissioners, to produce harmful radiation in a working area if you're in one of those businesses. Those who have small quantities of the material aren't affected by the requirement.

PRAISE FOR QUARTZ LAMP BRAZE—Stainless and titanium honeycomb are joined faster with a new method that employs thin heat lamps enclosed in quartz tubes. It marks another milestone for such lamps which every day find their way into more industrial processes. The method was developed by Armour Research Foundation, Chicago. Grumman Aircraft, Bethpage, N. Y., and Twin Coach Co., Buffalo, are licensed to use it.

RUBBER WITH LONGEVITY—Tires on pallet trucks will wear four times longer than today's standard product when they're made of the new polyurethane rubbers. One maker, Goodyear, attributes such performance to better resistance to cutting, chipping, and chemical attack.

METAL SPINNING RESEARCH— The University of Michigan, under the sponsorship of the Army's ballistic missile agency, is investigating what happens to metal when it's formed by spinning. Researchers are using brass and aluminum sheets spun into cones of various sizes. They want the facts on tensile and yield strengths, ductility, surface hardness, and a rundown on changes in the microstructure.

WELDING IN VACUUM— Try welding in a vacuum instead of a protective atmosphere, recommend J. A. Stohr and J. Briola, Commissariat a l'Energie Atomique, Saclay, France. Advantages: Better control of working pressures; freedom from gas handling problems; the heat affected zone is quite small, reducing distortion; and it's a cheaper way to make high quality welds. The Frenchmen use electronic beam welding.



The sparks fly as a ceramic tool cuts steel at 16,454 sfpm

You Can Make Ceramic Tools Pay Off

A 30-month research project uncovers some ground rules that will help. Two suggestions: Use an edge land on the tool, and avoid short, interrupted cuts

WHEN you put ceramic cutting tools on production machining jobs, you can have fantastic success or an epidemic of trouble. Here are ten guideposts that can help you get the most out of ceramics in your plant.

They are the products of a 2½-year study at Ohio State University, sponsored by Warner & Swasey Co., Cleveland. Prof. H. D. Moore and Dr. D. R. Kibbey, department of industrial engineering, were in charge. These points, they suggest, must be considered if ceramics are to pay off in production.

1. They work best on long, uninterrupted cuts.

Varying the cut length, OSU researchers found that the longer the cut (the fewer the starts), the bet-

Research Points Up Future for Ceramics

"Ceramics were introduced with a flare and glamor that has left some people doubting their practical potential. The doubts are particularly strong when users try the tool material and it fails—despite published claims and known work on ceramics by the Russians," says R. T. Hook, chief metallurgist, Warner & Swasey Co., Cleveland.

"The study reported in this article was sponsored by Warner & Swasey to find out as much as possible about the role of ceramics in the future—to provide our own shop with information which would permit the early introduction of this cutting tool material to its proper application, and to serve our customers who need further information about the use of ceramics.

"No thought was given to prior cutting materials, such as carbides, when the test was undertaken. The use of statistical analysis to confirm the significance of the data collected is probably a 'first' in metal cutting research.

"OSU's Professor Moore has stated he feels that if the carbides had gone through a thorough study of this kind when they were first introduced, industry might have saved billions of dollars spent by thousands of people in their own cut-and-try research. This ceramic test, and others like it, should accelerate the rate at which the new material is adopted as an efficient production tool.

"The use of land angles, as recommended by Professor Moore and Dr. Kibbey, is an outstanding contribution to industries learning how to make ceramics work. The fact that they have found a wetting takes place between the ceramics and the workpiece (STEEL, Oct. 7, 1957, p. 168) is startling. Most writers have concluded that ceramics do not have any affinity for the work, particularly in steel.

"Some of the outstanding applications for ceramic cutting tools are:

"1. As a finish turning for uninterrupted cuts.

R. T. HOOK, chief metallurgist, Warner & Swasey Co.

"2. On hard materials that resist cutting by other tool materials.

"3. On abrasive materials, such as cast iron, where ceramics have great resistance to wear.

"4. As a replacement for some grinding operations (particularly on materials 40 Rc and higher) because of the improved surface finishes ceramics will produce at the higher speeds they can take."

ter the tool life. In three tests, the results were: In 25 short passes, the cutters removed only 7.9 cu in. of metal before they were worn; in 23 slightly longer cuts, 39 cu in. of metal were removed before tool failure; in nine long cuts, the tool removed a whopping 63 cu in. before failure.

The time for major tool wear or failure is nearly always during some initial contact with the work rather than during a cut. Over 95 per cent of all tool failures were at, or near, the point of initial contact.

2. The higher the cutting speed, the shorter the tool life.

Ceramics behave like all other tool materials when it comes to the speed-life ratio, but speed has less effect on ceramics than on most other tool materials. With the materials used (mostly SAE 1045), speeds in the 500 to 1500 sfpm range are practical, varying with the tool geometry and depth of cut. The life of a ceramic tool at 1500 sfpm is about equal to that of a carbide cutter under similar conditions at 500 sfpm.

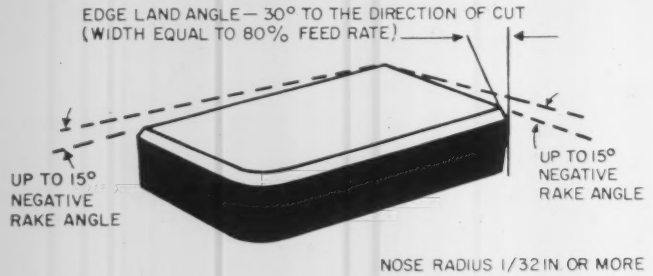
3. An edge land is a must. It may be the key to roughing cuts.

The engineers reported: "By far, the most important discovery to date has been the effect of . . . an edge land on the tool." Sharp edges tend to chip or to flake, particularly on deep cuts. Edge lands reduce the tendency to chip, and they permit higher feed rates (as high as 0.037 in. a revolution at 1000 sfpm). The ideal land, extending around the side, radius, and front of the tool, is a rounded edge, polished, with a radius no larger than the feed (chip thickness).

As a compromise between an ideal land and one that's easy to generate, try a flat one, sloping at 30 degrees to the cutting direction, with a width equal to about 80 per cent of the feed distance.

4. With sharp edged tools, life is doubled when the cutting starts are slow.

The report states: "With a


EDGE LAND ANGLE — 30° TO THE DIRECTION OF CUT
(WIDTH EQUAL TO 80% FEED RATE)
UP TO 15° NEGATIVE RAKE ANGLE
UP TO 15° NEGATIVE RAKE ANGLE
NOSE RADIUS 1/32 IN. OR MORE

This tool geometry makes a good starting point for efficient cutting. Although factors like speed, feed, and depth of cut may change your specific needs, tests conducted at Ohio State University proved this design to be basically sound

rounded cutting edge, starting speed has almost no effect. With a sharp cutting edge, slow starts give a definite improvement in tool life. It should be noted that even with slow starts, the rounded edge performed better than the sharp edge."

To avoid chipping of sharp tools, start and stop the cut at lower speeds than you use in the main portion of the cut. Slow starts were tried at 200 sfpm, fast starts at 1000, 1500, and 2000 sfpm.

5. For machining steel, double negative rakes probably are better than positive rakes.

When using brittle tool materials, such as ceramics, positive rake angles contribute to edge chipping and fracture. Within the proper range, say 0 to −15 degrees, variations in rake angles have only small effect.

6. Use a nose radius which is as large as possible.

It should be larger than the cut depth when practical but not large enough to induce chatter and vibration. The report says: "Large nose radii are desirable for increased tool life regardless of the edge shape used as long as chatter doesn't develop. This has been proved true with sharp edges, flat edge lands, and edge radii."

7. Grind marks and scratches on the tool surface shorten its life.

Visible marks should be removed. Photomicrographs show that failure is primarily a grain-by-grain process. It seems reasonable to believe that if no corners or sharp grain edges project above the mean surface of the tool, the failure process might be slowed down.

Tool tips were polished by rubbing them against a leather pad covered with a mixture of 600 grit boron carbide and oil.

8. For best tool life, start the cut into a shoulder that has been finish machined.

The better the finish on the starting surface or shoulder, the less chipping of the cutting tool you're likely to get.

9. Relief angles should be less than 20 degrees.

Within the range of 5 to 15 degrees, changes in relief angles have little effect.

10. Medium-hard steels can be cut at good speeds.

Steel in the 200 to 500 Brinell range was cut. The report states: "Satisfactory cutting was accomplished on 500 Bhn 4150 steel at speeds as high as 500 sfpm. Also, 300 Bhn 4150 cut well at 1500 sfpm with the same tools, using the radius edges in all cases."

• **Conclusion**—Don't give up if you try ceramics on a job that seems a natural, then run into short tool life, advise Professor Moore and Dr. Kibbey. Give careful consideration to the many variables that affect life, including two things not mentioned above: Unequal clamping stresses and vibration.

The investigators conclude: "It is possible that a simple correction will permit the ceramic tool to become extremely valuable."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Antifreeze May Harm Aluminum Auto Engines

The possibility of more light metals in auto engines and cooling systems may pose new antifreeze corrosion problems.

Leonard C. Rowe of General Motors Corp., points out that antifreezes and rust inhibitors that prevent corrosion in present auto engines and cooling systems may not be preventives in aluminum engines or radiators. He anticipates pitting and galvanic corrosion regardless of how extensively aluminum is used.

He warns that either chemical manufacturers must be prepared to provide materials which are effective in a light metal cooling system, or alternative methods of cooling must be found.

He suggests that the chemical industry initiate research programs to study the effect of water quality on corrosion and inhibition, the effect of heat transfer on metal corrosion, and the effectiveness of inhibitors in crevices and low velocity coolant area. He also suggests research might be done on the effect on corrosion of service variables, such as poor maintenance, antifreeze re-use, and driver habits.

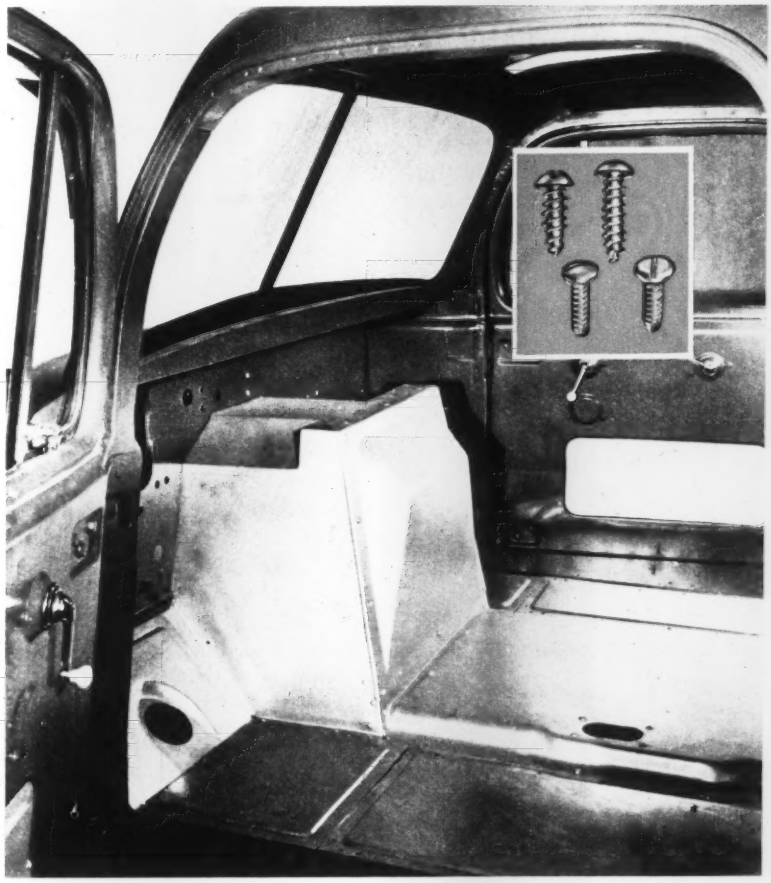
Bath Dissolves Porcelain

You can reclaim porcelain enameled rejects in 5 to 15 minutes through the use of a chemical process known as Kolene denamel, developed by Kolene Corp., Detroit.

The process removes all traces of porcelain without attacking the base metal. Costly blasting and lengthy soaking operations are not necessary. A water rinse after immersion in the chemical is all that's needed to make a panel ready for re-enameling.

A typical installation contains the chemical bath, controlled to maintain the necessary 900 to 950° F temperature, and a water rinse tank. Mechanical agitation of the bath insures good heat transfer, circulates sludge, and controls sludge settling.

Kolene says it will predetermine exact time cycles and handling procedures for buyers of the equipment.



Aluminum panels, fastened with screws of the same material, cut weight and increase corrosion resistance in this truck cab. Inset: Typical sheet metal screws

Aluminum Screws Cut Costs

By FLOYD A. LEWIS
Technical Secretary
Aluminum Association
New York

Last in a Series
The first article discussed aluminum rivets and their uses. Topic of last week's article was aluminum bolts, machine screws, and washers

HOW TO MAKE better sheet aluminum products and trim manufacturing costs: Where sheet metal screws are called for, fasten with aluminum.

Here's why: Aluminum screws are strong enough to develop the full strength of the joined parts. They are light, corrosion resistant, and give the products a uniform appearance. Low material cost and easy installation reduce manufacturing costs.

• **Eliminate Tapping**—Sheet metal screws are simply driven into drilled or pierced holes of the proper size; they require no costly tapping, but provide a secure threaded fastening.

The hole should be slightly smaller than the major diameter of the screw; it must be small enough to permit maximum holding power, yet large enough to prevent thread damage.

• **Harder Alloys Used**—Since the screws displace the metal into which they are driven, they must be harder and stronger than the metal being joined. They are limited generally to use with the softer aluminum alloys.

They cannot be used to join 2024-T4 sheets (the screws themselves are made of that alloy and in that temper).

• **Two Types Available** — Type A (gimlet point) screws are used for fastening lighter gages of sheet aluminum, Type B (blunt point) for heavier gages of sheet aluminum, extruded sections, or castings.

Both types are available in several head styles, with a choice of slotted or cross-recessed heads.

• **Applications** — Many products made from aluminum sheets and extrusions—from toys to larger products, such as heating ducts or buses—are assembled with aluminum sheet metal screws.

• **Three Types of Washers**—Plain washers protect parts from mechanical damage, spread load over a wider area, or improve appearance; finishing washers are used to dress up the product; and spring lock washers permit vibration-resistant joints to be made entirely of aluminum.

• **Take Many Finishes**—Mechanical, chemical, or electrochemical finishes may be applied to the fasteners; they may also be painted, enameled, or lacquered. Often they are anodized to increase resistance to corrosion, abrasion, or wear.

Dye is often used on fasteners to identify alloys; when products are finished after assembly, exposed surfaces of fasteners are given the same finish as other aluminum parts to preserve uniform appearance.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

JOB:
Clean and refill grinding machine sump tanks.

It used to take 3 manhours. Now, with the cleaner shown at right, the job is done by one man in 30 minutes.

Saved: 2½ manhours every time a machine is cleaned.
Also, since all cleaning is done on a 30 minute break, maintenance no longer cuts into production time.

Two machines are cleaned once a week; another high production grinder is cleaned three times a week.

Total savings for the five cleanings: 12½ maintenance manhours a week and 5 production hours on the machines.

How We Beat the Cost Crisis

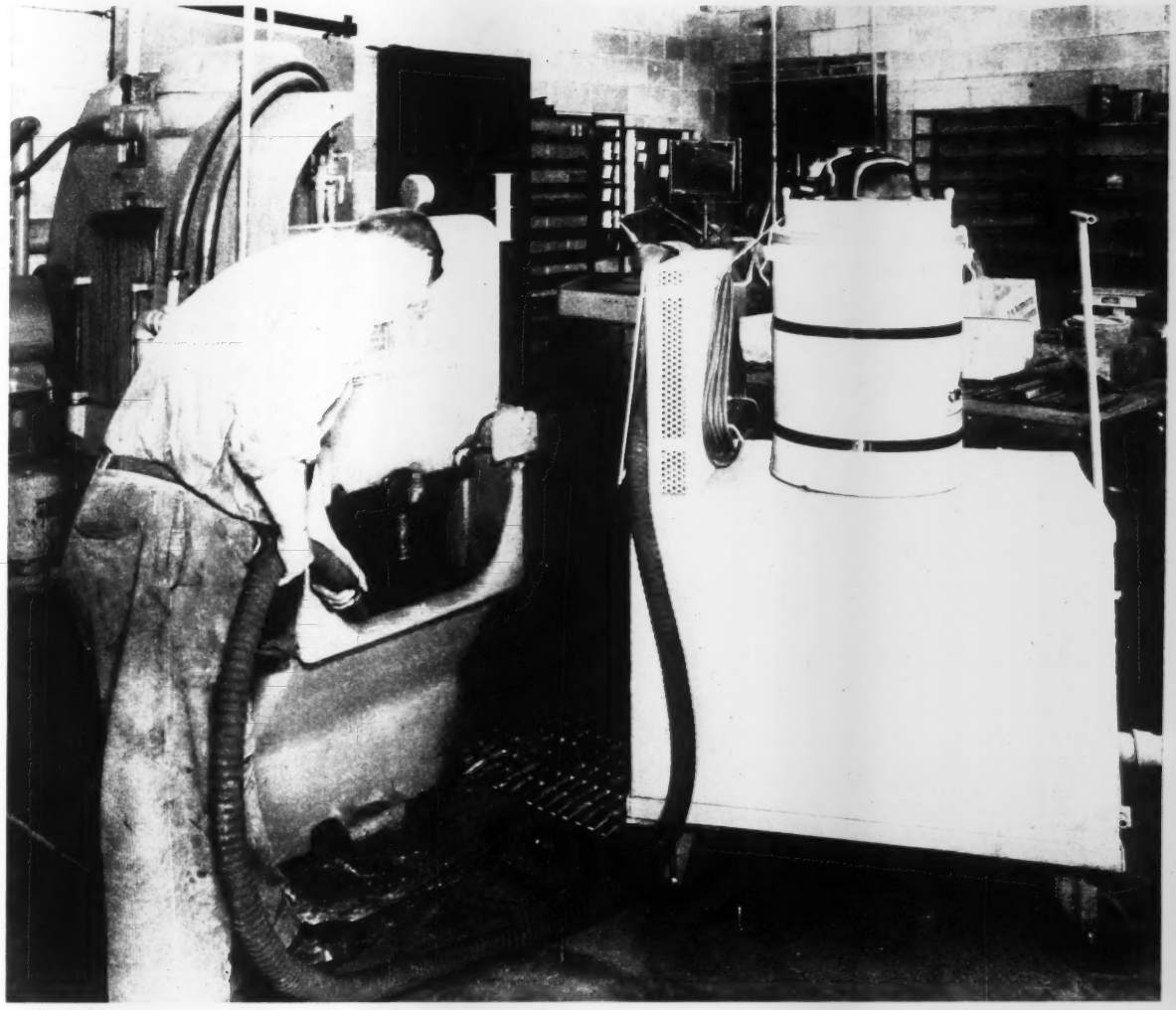
Machine Service Unit Gets Rid of Costly Downtime

This homemade maintenance machine cost only $300. Company now can drain, clean, and refill grinding machine sump pumps during a 30 minute lunch break. This is one of the top entries in the Cost Crisis Awards Competition conducted by STEEL. Another will be published next week

HALF the cost battle is won on some production lines when you figure how to keep the machines running. It means eliminating, or at least minimizing, budget-shattering downtime.

Here's how Adamas Carbide Corp., Kenilworth, N. J., solved the problem. A homemade vacuum tank has eliminated all the productive downtime formerly required to service the coolant sumps on two, No. 11 Blanchard surface grinders.

• No Time—The machines are operated on a three-shift basis. Coolant tanks have to be emptied, cleaned, refilled, and additive added. The only way to avoid interrupting production is to do the job



In 20 minutes, the machine sump will be empty—ready for refill

on a 30-minute lunch break.

Gerard Scheyer, plant engineer, says: "We tried mechanical pumps of all types, but the diamond and carbide particles in the coolant wore them out in less than one application. On top of that, the operation took two men at least an hour and a half—an hour of which was production time."

• **Solution**—Engineers investigated vacuum sump cleaning and decided to build their own unit. They started with a reinforced tank and an industrial vacuum cleaner.

The cleaner is mounted into the top of the tank. A 1½ in. opening cut into the tank side serves as an inlet for the suction hose.

The maintenance man immerses the end of the hose into the grinder sump tank and turns on the vacuum pump. It takes 20 minutes to drain the sump tank, 5 minutes to wash it out, another 5 minutes to refill it. Total time for the one-man job: 30 minutes.

A refinement was added, Mr. Scheyer told STEEL. Fresh water was piped directly to the machines, speeding up flushing and refilling.

• **Reclaim**—A valve is mounted 3 in. above the floor of the service tank. After the maintenance man has allowed enough time for the sludge to settle, he drains the vacuum tank. When he sees the water begin to run cloudy, he knows enough sludge is in the tank to require cleaning.

• **The Payoff**—Since each of the two Blanchards must be cleaned once a week, the new service unit saves the maintenance crew 5 hours a week. The old method robbed production of an hour a week on each of the two machines.

• **Extra Duty**—The unit is used to service a high production Besly-Welles grinder that has to be cleaned three times a week.

It also offers an improved method of reclaiming tungsten carbide and diamond particles, accounting for an over-all saving of 35 per cent in diamond wheel costs.

Fibrous Material Keeps Out the Heat

Formed into shapes or spread on with a trowel, it has almost four times the insulating value of commercial firebricks at comparable temperatures, and is lighter

DIFFICULT insulating problems may be solved by a new material that is not only light but has excellent resistance to heat.

Called fibrous potassium titanate, the product is a compact mass of white crystalline fibers. Because of the small diameter (less than 1/25,000 in.) and high reflectance of the fibers, the material blocks heat penetration by scattering incoming infrared rays.

• **Being Evaluated**—The material was developed by the Pigments Dept. of E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. It is being produced on a semiworks scale at the firm's Newport, Del., plant. A decision to manufacture commercial quantities must await results of evaluation studies.

Fibrous potassium titanate appears best suited for applications where space and weight are critical, explains Dr. J. B. Sutton, specialty products sales manager of the Pigments Dept. In the 1300 to 2100° F range, it is about twice as effective on a volume basis as any known insulating material, he says.

As a thermal insulator at high temperatures, the material may offer construction advantages for rockets and missiles, aircraft, and atomic-powered vehicles. Suggested, but as yet untried, uses include insulation for missile nose cones and rocket combustion chambers.

Other suggested applications include electrical and acoustical insulation, reflective shielding for heating units and ovens, gaskets and packing, filters, fire blankets and protective clothing, high temperature paints or coatings, and plastic reinforcement.

• **Easily Formed**—Blocks of fibrous potassium titanate, which can be formed into any desired shape while wet, show exceptional dimensional stability upon prolonged exposure to heating. After six days' aging at 1900° F, blocks have shown no dimensional change.

The material has almost four times the insulating value of commercial firebricks at comparable temperatures with one-twelfth the weight of firebricks, says Dr. Sutton.

One of the unusual advantages is ease of fabrication. Available forms include loose fibers, loose fill, blocks of varying densities, mats of various thicknesses, and "lumps." Also available is a trowelable material which, when combined with water, can be spread onto almost any irregular surface like mortar.

Contour wheel dresser with single diamond is accurate

Tool Dresses Two Wheels

A recently developed dressing technique uses a single-diamond tool to handle complex contours on double grinding wheels. Two-diamond method is conventional approach

ONLY ONE diamond is needed to dress a double grinding wheel used to contour grind airfoil lugs on jet engine blades, two at a time, to 0.0002 in. at Thompson Products Inc.'s jet division, Cleveland.

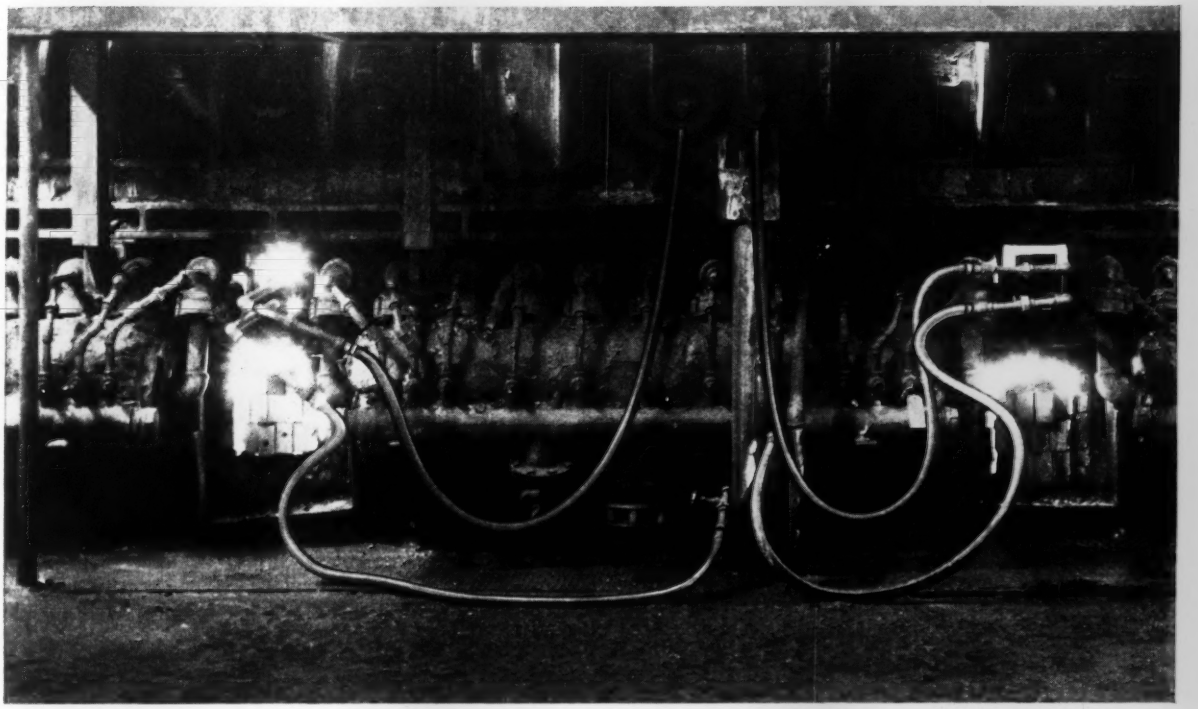
Seven blade sizes are produced for the Pratt & Whitney J-75 engine.

The single-diamond technique is said to be the latest in wheel dressing of complex contours and double wheels. The unit was developed by Hoglund Engineering & Mfg. Co., Berkeley Heights, N. J.

Installed on a Thompson Model C surface grinder, the dresser moves into action after about 50 grindings. The key to its accuracy is cam control of the diamond. As it traverses the wheel face, the diamond is pivoted about its own point so that it is always at the proper angle to the face.

PEERLESS WATER HOSE

BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable skids and keep its pipe mill in operation. U. S. Peerless is part of the complete line of U. S. Rubber's industrial hose, engineered for use and abuse.

• • •

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Mechanical Goods Division

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WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Television receiver (top right) in the pulpit of the roughing mill allows operator to make an instant check on progress at the reversing mill

TV Links Rolling Mills

It enables roughing mill operator to ready billets for the finishing mill at the right moment. A 15-second delay could cool the steel enough to make it hard to work

HOW do you keep tabs on two operations that must be co-ordinated, but are more than 700 ft apart?

Dominion Foundries & Steel Ltd., Hamilton, Ont., has done it by adding closed-circuit television to a communications system that includes telephone intercom, whistles, and signal lights. The TV circuit helps co-ordinate the roughing and rolling mills on the tin plate line.

• **The Operations**—The two-high roughing mill takes billets at 2300° F and passes them back and forth through the rolls about 20 times, reducing them to a 1-in. thickness.

The strip is then passed to the four-high, 60-in. reversing mill that completes the operation, rolling down to the size required for tin plate and pipe production.

• **How TV Helps**—By checking the TV screen in his pulpit, the chief operator of the roughing mill can read a gage at the reversing mill, enabling him to adjust table and roller speed so the billet will be ready for the reversing mill at the right moment. A 15-second delay on the roughing mill can reduce the temperature of the steel enough to make it difficult to roll during the final stage.

A second television monitor and camera control unit, in a small office near the second mill, are used for testing and alignment purposes, and as standby equipment.

General Precision Laboratory Inc., Pleasantville, N. Y., built the equipment.

New Scale Cars Are Safer

More efficient handling of ore and greater safety to personnel and equipment are promised by two new 320 cu ft scale cars being built at the New Castle, Pa., plant of Pennsylvania Engineering Corp. The cars have seven different types of safety devices.

Motorized with trolley power pickup, each discharges its load only when the car bin is directly over the receiving hopper. (Two photoelectric cells, one on the car and one at the hopper, must line up before a valve in the cylinder line can be opened.)

Various components (such as lights, air compressor, and dynamotor) are on separate padlocked safety switches to provide maximum safety. All electrical equipment is weatherproofed to insure long life.

An air horn and bell serve as warning signals. The bell rings continuously while the car is in motion; the horn is controlled manually. A red gyrolite on each end of the car glows when the car is moving.

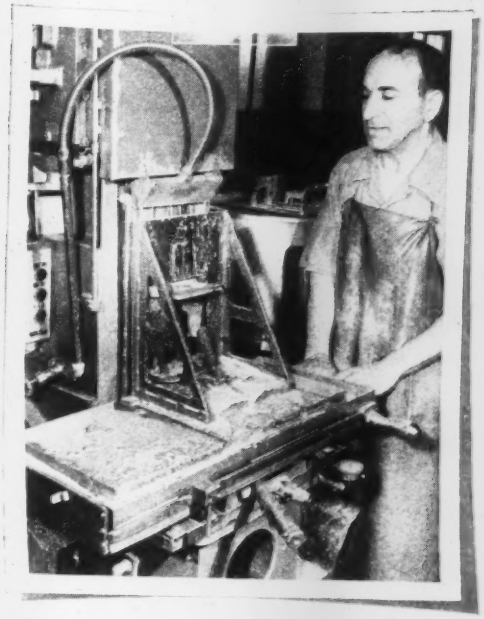
Another safety feature, a valve in the air brake line, prevents moving the car electrically unless pressure is sufficient to operate the brakes properly.

The cars have automatic printing and recording scales, as well as visual dials. The scales give accurate control and positive record of the material charged to the blast furnace, helping the operator to produce iron at the optimum rate.

The cars will meet close clearance tolerances of existing bins and hoppers. The bin gates are of the undercutting type to provide minimum height of the bin above the rails.

A 3M Case History Report

GRINDING PRODUCTION INCREASED 50% WITH "WETORDRY" BELTS



MANUFACTURER: Dictaphone Corporation

ADDRESS: Bridgeport, Conn.

PRODUCTS MANUFACTURED: Dictating Equipment

3M ABRASIVE USED: "WETORDRY" Tri-M-ite Cloth Belts

HOW 3M ABRASIVES ARE USED: Sizing bottom side of cast magnesium main frame of Dictaphone dictating machine, to remove burrs and casting imperfections for true flatness.

OPERATIONAL DATA ON 3M METHOD: Grit 60 "Wetordry Tri-M-ite" Cloth Belt is used on an Engleberg Huller BG8 Grinder. Constant flow of water is maintained over grind surface of the magnesium.

OPERATIONAL DATA ON PREVIOUS METHOD: A competitive brand of abrasive belt was used for the same operation.

PROVEN ADVANTAGES OF 3M METHOD: Production increased 50% per belt—from 900 pieces with the former belt to 1,350 pieces per 3M Belt with no loss in time or decrease in quality.

OTHER 3M ABRASIVE PRODUCTS NOW IN USE: "Three-M-ite Resinite" Cloth Belts are used to finish aluminum trim bands; "Tri-M-ite" Cloth "PG" Wheel used to pre-polish dictating belt mandrel ends.

WANT MORE INFORMATION? Send for free manual, "3M Method of Belt Grinding and Finishing." Just write on your letterhead to 3M Co., St. Paul 6, Minn., Dept. GJ-128.

"Wetordry", "Tri-M-ite", "Resinite", and "Three-M-ite" are registered trademarks of 3M Co., St. Paul 6, Minn.
Export: 99 Park Ave., New York. Canada: London, Ontario

3M Coated Abrasives
"WETORDRY" CLOTH BELTS

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW
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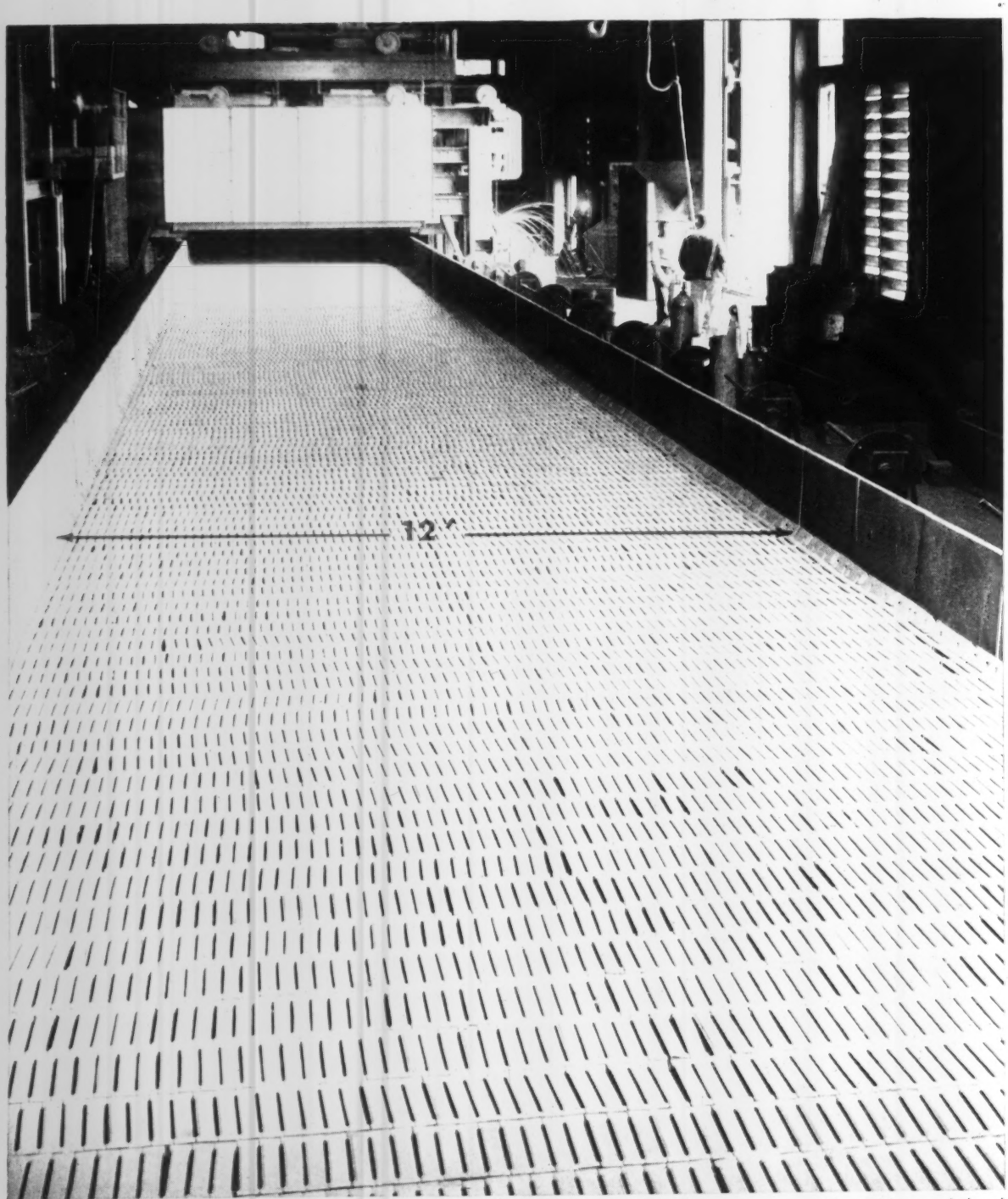
FOR NATIONAL STEEL

KOPPERS BUILDS WORLD'S



Weirton Steel's sintering machine is one of the world's two operating 12-foot wide machines for sintering iron ore. This machine was designed to produce a minimum of 5,500 tons of sinter product per day.

LARGEST

SINTERING MACHINES

The two largest iron ore sintering machines in the world—both 12 feet wide—are now in operation. Both are part of plants built by Koppers. Both are helping Divisions of National Steel Corporation improve productivity.

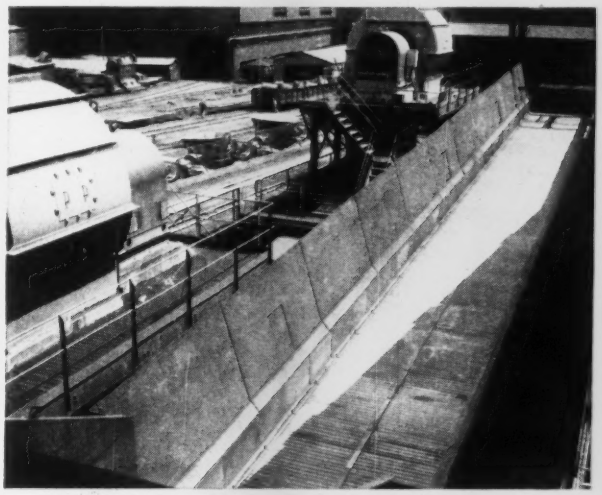
The machine shown here is operating at Weirton Steel Company. It is 12 feet wide, 147 feet long over the wind boxes, has a total grate area of 1,764 sq. ft. It was designed to produce 5,500 tons of sinter product per day.

An even larger machine is also in production at Great Lakes Steel, another Division of National Steel Corporation. This new giant is 12 feet wide and 199 feet 6 inches long over the wind boxes. It was designed to produce 7,200 tons of sinter product per day.

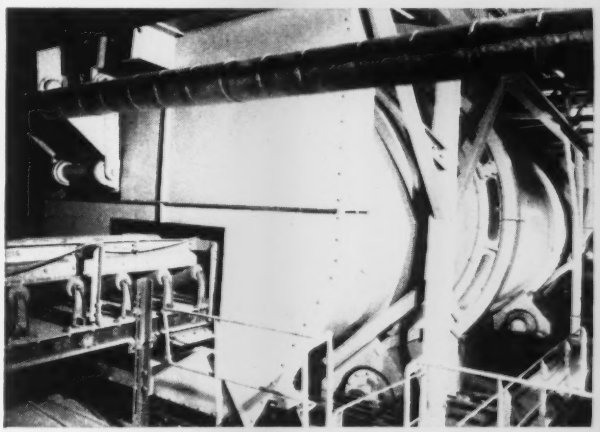
These two pioneering machines are typical of the continual modernization program being carried on throughout the National Steel organization. A forward-looking approach on the part of National Steel's operating and management personnel, and their complete co-operation and assistance during every phase of engineering and construction, contributed greatly to the successful completion of these two projects by Koppers.

Comprehensive Koppers service to the steel industry includes design, engineering, procurement, construction and initial operation of almost any type of equipment.

If you need help or advice on any expansion or modernization project, call on Koppers—the world's largest, most experienced, best qualified steel-plant construction firm. Our engineers and management personnel can be reached at Koppers Company, Inc., Engineering and Construction Division, Pittsburgh 19, Pennsylvania.



The straight-line, forced-draft sinter cooler of Weirton Steel's new sintering plant is 10 feet wide, 147 feet long.



This 12′ x 40′ balling drum, in use at the Weirton plant, is designed to prepare the raw mix material fed to the sinter machine.

YEARS OF ENGINEERING AND CONSTRUCTION SERVICE

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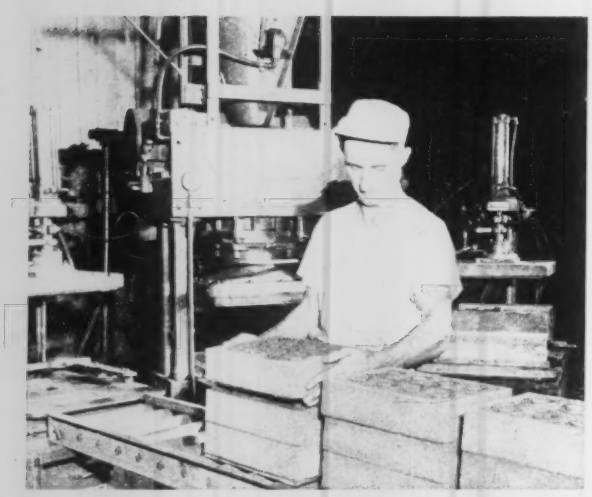
KOPPERS



Hardened molds are placed on conveyor that will take them to the gassing area

Some of the castings produced by the Azcast technique at Swayne, Robinson & Co.

CO_2 Technique Upgrades Castings

Principal advantages are tighter dimensional tolerances, greater fidelity of detail, and smooth surfaces. Buyers report considerable reduction in machining costs

THE AZCAST CO_2 molding process provides high quality castings while saving dollars in production, reports Swayne, Robinson & Co., Richmond, Ind., a foundry specializing in gray iron and aluminum castings.

C. K. Robinson Jr., vice president, describes the process as a practical step between the high cost of quality and the low cost of fast production.

• **Principal Advantages**—The technique produces parts with above average dimensional advantages. Tolerances have been held to plus or minus 0.015 in. with extremely smooth surfaces.

Fidelity of detail characterizes the castings which have included such parts as impellers, pinions, gears, rings, and housings cast in both aluminum and gray iron.

The CO_2 process also eliminates mold flasks, slip jackets, bottom boards, and weights, and does away with driers and coreplates in making cores. Those advantages more than offset the additional cost of gassing the molds and cores.

• **Pattern Equipment** — Since the final accuracy and finish of the castings depends on the impression made by the pattern on the mold, careful attention must be given to pattern preparation.

A basic aluminum box contains the pattern equipment. Two boxes are required for a cope and drag or for high production of one pattern.

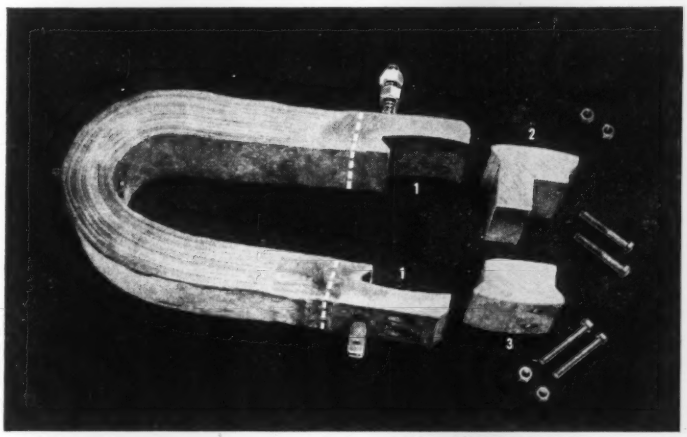
The pattern plate should be aluminum, but the patterns themselves should be brass to withstand wear of the blown sand, explains Mr. Robinson. Vertical surfaces may not require draft, nor is there need to make expansion allowances on the pattern.

• **Sand Mix Is Key** — The proper mix of sand, binder, and release agent is necessary to produce a mold that will develop sufficient heat resistance and reduce gas development. In the CO_2 process, sodium silicate is mixed with the sand; passing CO_2 through the mix hardens the sodium silicate to produce a hard, smooth surface.

The sand mix is blown under high pressure into the pattern box. A squeeze plate is rolled between the blow plate and the mold box. The mold is squeezed, removed from the molding machine, and placed under the gassing machine where the mold is hardened. The molds are automatically raised from the box by stripping pins and then placed on a conveyor to be poured.

In some cases, stack molding has been used successfully with savings in metal yield and molding cost.

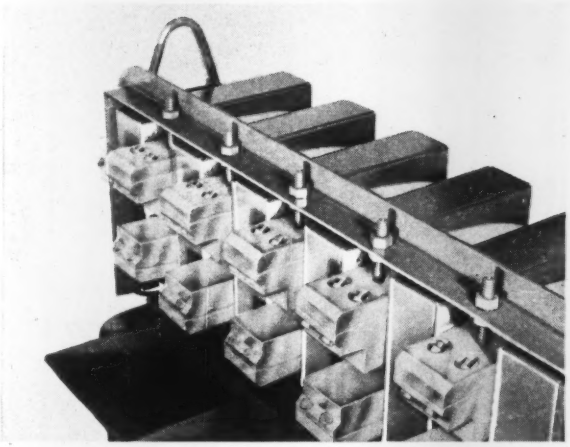
$70 COST CUT for each electrode assembly—through use of Anaconda extruded copper shapes—helped Frank C. Cheston Co. add replaceable contact feature in its line of electric rivet heaters.



Electric rivet heaters are tough, simple machines that have for years been saving time and money in riveting operations. But Frank C. Cheston Co., Newark, N. J., saw a chance to save its customers some money in maintenance, too, by making electrode-assembly contacts easy to remove for resurfacing or replacement.

Originally these contacts were integral with the laminated copper conductor forming a one-turn secondary in the step-down transformer. In redesign, only parent blocks (1, at left) are welded to the conductor. Contact shoes (2 and 3), which mate precisely with parent blocks for unimpaired conductivity, are easily removed by unbolting*.

Machining pieces 1, 2, and 3 from copper bar stock ran costs so high that the price of the heater would have become unrealistic. American Brass specialists were consulted and precisely shaped extrusions of high-conductivity copper were produced, from which the finished sections are cut. Tolerances were closer and surfaces finer than with machining—and costs per electrode assembly were cut $70.



Close-up of a 5-electrode Cheston electric rivet heater with the new removable contact feature for easier maintenance. Savings from use of Anaconda extrusions enabled Cheston to include this new feature at practically the same price as heaters of previous design.

Cheston electric rivet heater in use showing how step-design of upper contact (2, in illustration above, left) makes it easy to heat both long and short rivets. Contacts are opened by foot pedal and contact pressure is maintained by springs seen just above the pedal.

Bolts are of Everdur®, Anaconda copper-silicon alloy.

Cutting shop costs may be easier than you think. Take a fresh look at the way you're making metal parts. Make a note of any part you suspect might benefit by the use of extrusions, special-shaped tube, die-pressed forgings, etc. Then call in your American Brass Company representative and talk it over with him. He will see that your problem gets to the right Anaconda technical specialists promptly and will expedite the answer. Or write: The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda Brass, Ltd., New Toronto, Ontario.

3858

DIE-PRESSED FORGINGS • SPECIAL-SHAPED TUBES
EXTRUSIONS • FABRICATED METAL PARTS

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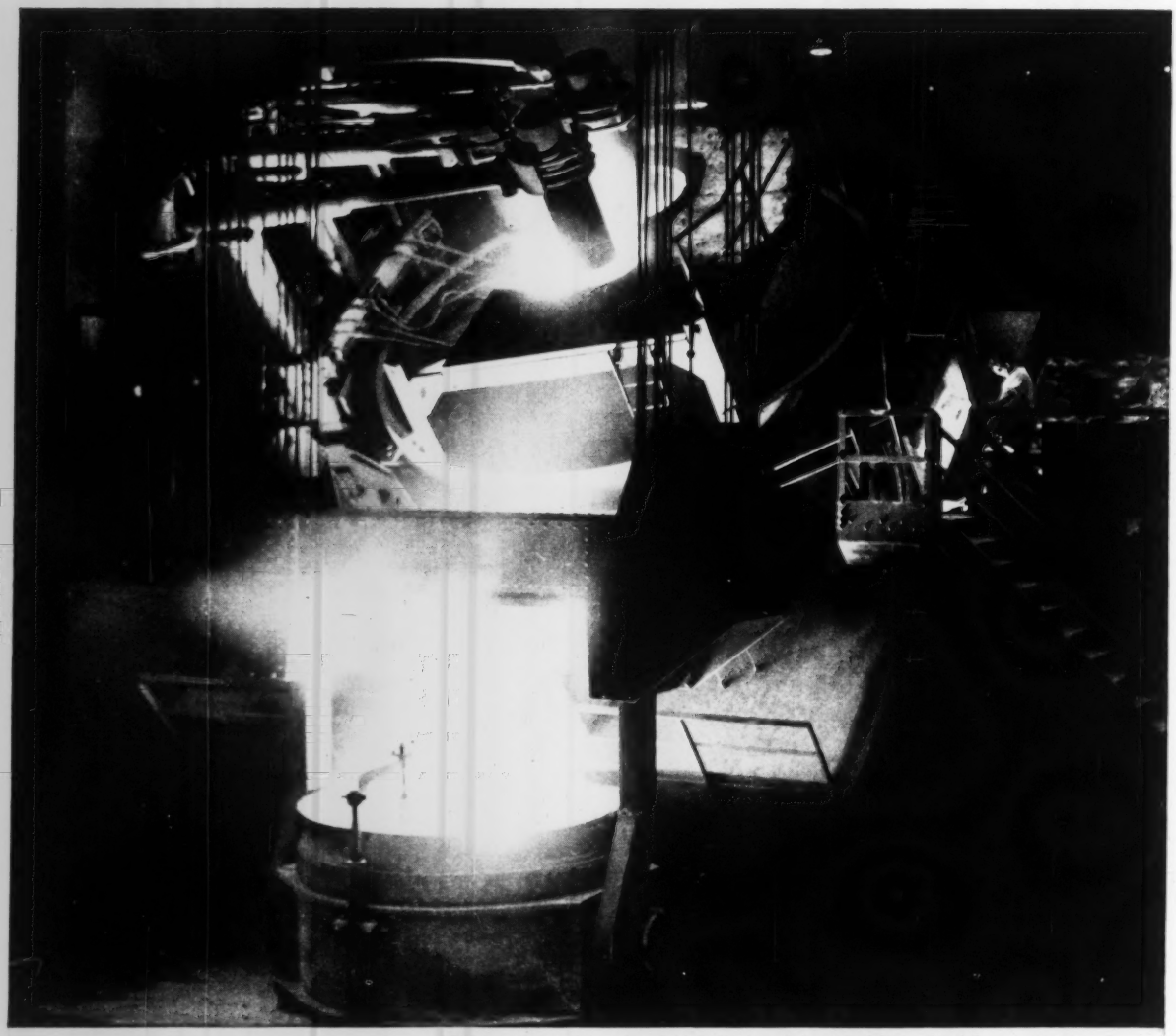


Photo courtesy of American Bridge Division of the United States Steel Corporation

BAKER'S MAGDOLITE AND JEBCOLITE
are always 5 ways better

Continued research and development throughout the years, plus The J. E. Baker Company's precisely controlled manufacturing methods, have resulted in the superior, properly burned, grain-sized Magdolite and Jebcolite particles which help provide:

More uniform ingots—increased ingot production—increased furnace efficiency—lower refractory costs—less defective production material.

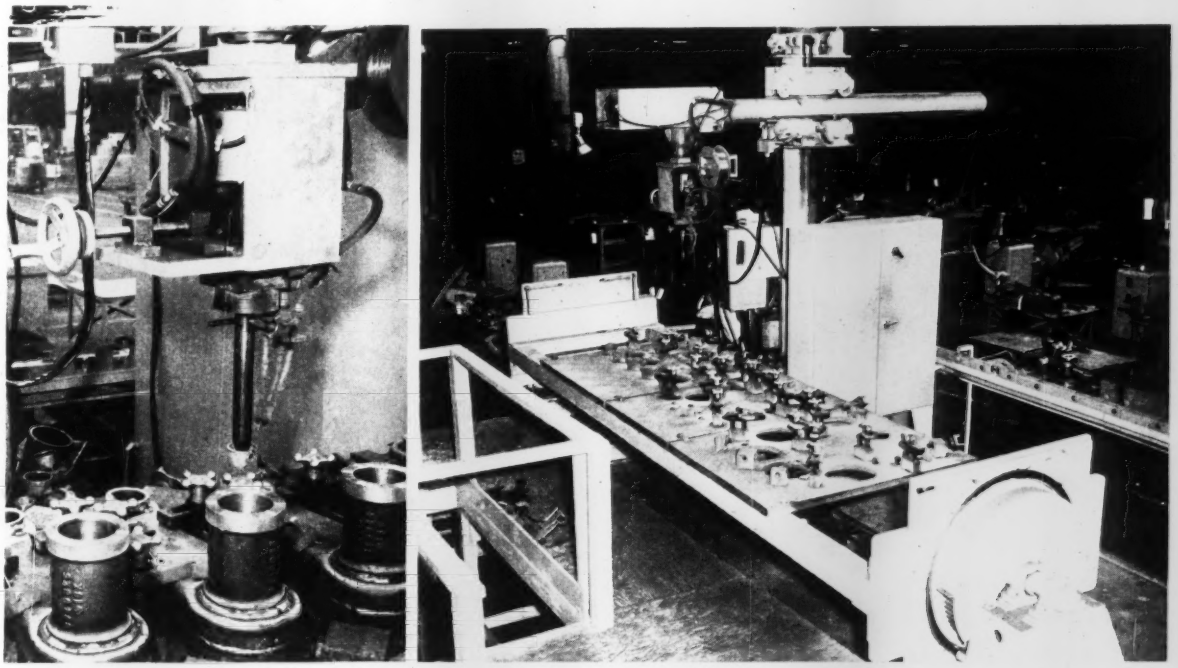
Magdolite and Jebcolite* are the *original* dead-burned dolomites that offer better composition, preparation, strength, economy and quality. Don't say "dolomite." Save dollars. Specify Baker's Magdolite for open hearth and Jebcolite for electric furnace use.

**Jebcolite has the same superior chemical, physical and mineralogical characteristics as Magdolite and differs only in grain-size which is designed specifically for electric furnace application.*

PRODUCTS
SINCE 1889

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA

PLANTS: BILLMEYER, YORK, PENNSYLVANIA — MILLERSVILLE, OHIO



Suspension arms Cadillac makes for its light tanks are shown in fixtures, ready for welding. Cast bearings are welded to both ends of stamped bodies. Dual Shield mounted on manipulator boom (right) rotates 370 degrees to make welds

Cadillac Adopts Dual Shield

Turning from submerged arc, this tank builder finds hidden profit in flux-CO_2 combination. More speed, deeper penetration, and stouter welds result. It's easily automated

SEMIAUTOMATIC welders are getting a big play for use with automatic equipment.

The reasons: Higher speeds, deeper penetration, improved physicals, and easier cleanup, compared with older methods.

That's the experience of Cadillac Div., General Motors Corp., which makes tanks and weapon carriers at its Cleveland Ordnance Plant.

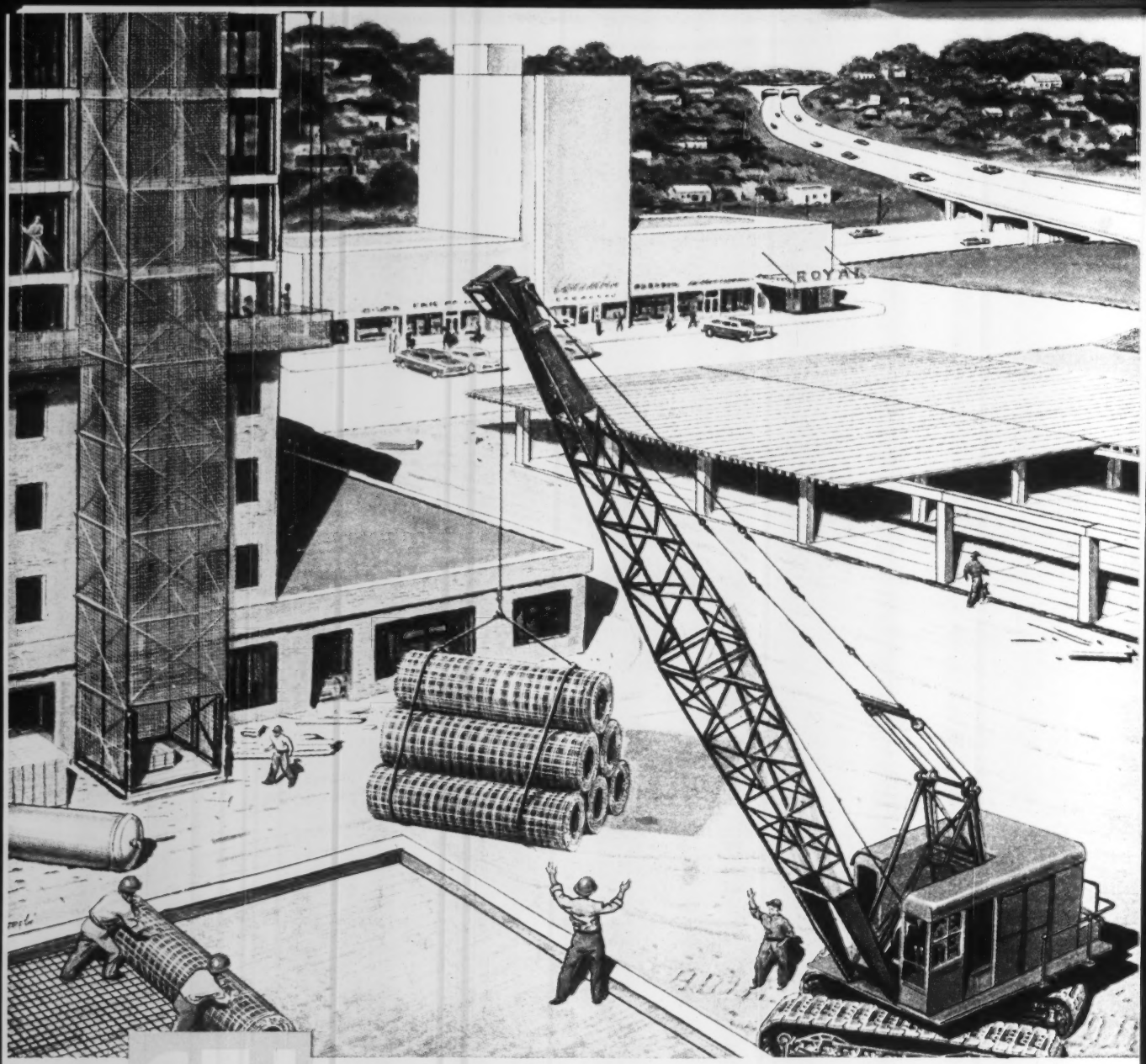
Almost all of its high strength welded parts are made of 4130 steel. The firm has turned heavily to Dual Shield, made by National Cylinder Gas Co. Div., Chemetron Corp., Chicago. It features an alloyed flux-cored wire and carbon dioxide (CO_2) shielding gas. Welds were formerly made with CO_2 shielding and solid wire which produced unsatisfactory welds.

• **Example**—Cadillac uses a fixture which holds eight suspension arms in an automatic welding setup. The head on a (Herrick) welding manipulator lowers, rotates the head to make the weld, retracts and indexes the device for the next arm. The operator only loads preheated parts and removes welded parts to a postheating device.

Each arm is made of a ¼-in. stamping with two cast bearing housings. (One is ¼-in. material, the other ½ in.) Dual Shield welds get about 50 per cent penetration while depositing a ¼-in. fillet at 25 ipm. The firm says its experience with stick electrodes showed only one-fourth to one-third as much penetration. Spatter is slight and the flux removes easily.

Joint tensile strengths of the weldments (using No. 112 wire) are usually well over 100,000 psi. Joint fit doesn't need to be as close as with the older methods and fillet appearance is uniform. Capacity of the setup is far beyond Cadillac's present daily requirements.

Dual Shield units are versatile: Other types of electrodes requiring gas shielding can be used. The wire can be applied to other equipment in kit form. The main changes are the gas cup, wire, and shielding gas. Dual Shield equipment also takes regular solid wire when necessary. Water cooling provisions, when needed, are self-contained.

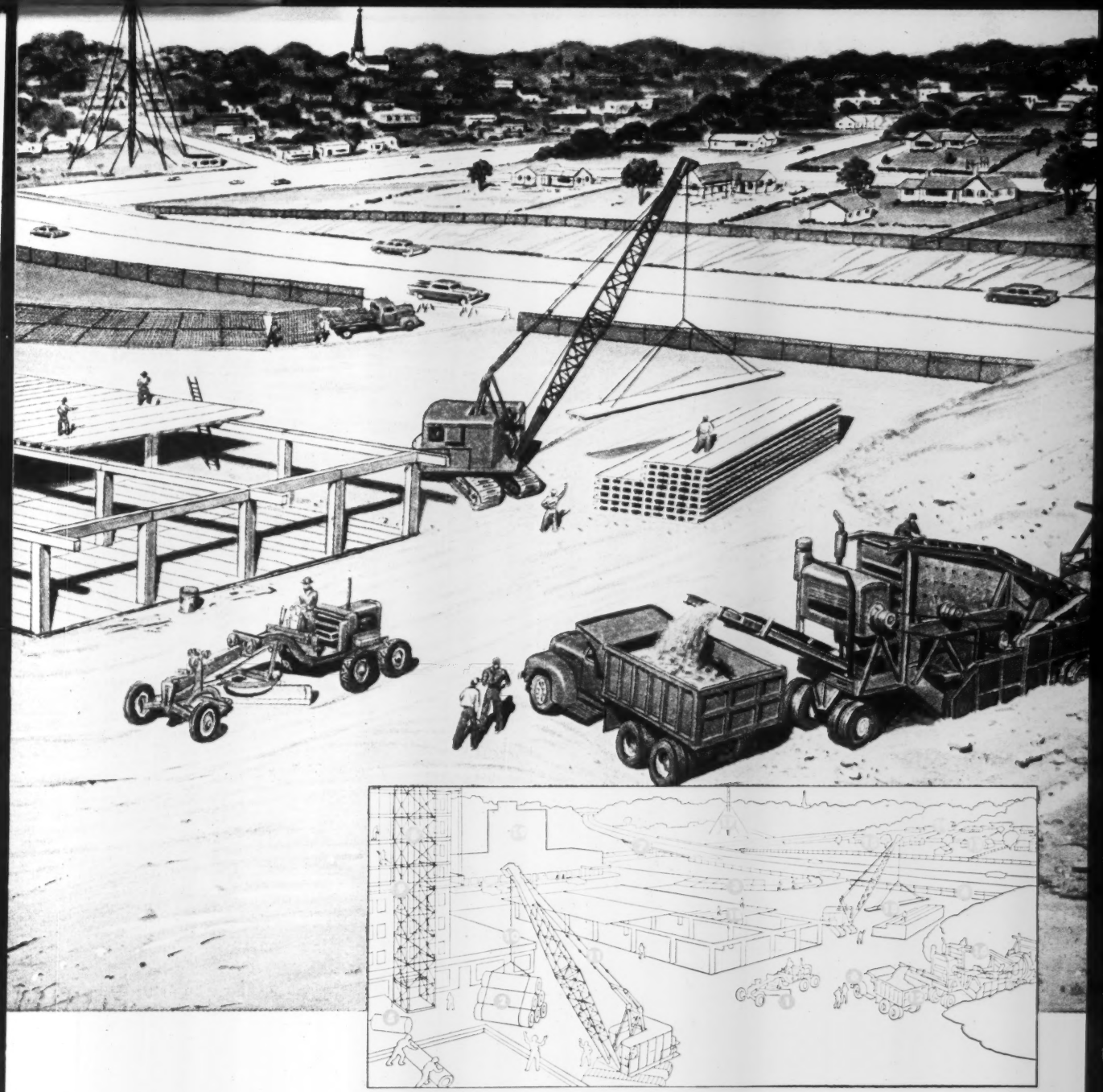


STEEL PRODUCTS...
used from the ground up

A seemingly endless variety of equipment and materials flow into the construction site for a modern suburban development project. Many of these are made of steel—from structural members to fabricated components...from materials handling to construction equipment. The logistics problem is a complicated one for all the contractors involved.

That's why many contractors... and other big steel users... are turning to CF&I as a single source for many of their steel requirements. CF&I manufactures a complete range of steel products—those shown here and many more. And steel buyers know they can count on quick delivery when they order from this completely integrated producer...know they can count on the top quality that has long been a CF&I trademark.

If you use steel in any form it will pay you to contact the CF&I Sales Representative nearest you.



in suburban development

1. CF&I Cutting Edges
2. Clinton Welded Wire Building Fabric
3. Clinton Welded Wire Road Fabric
4. Realock Chain Link Fence
5. Claymont Flanged and Dished Heads
6. Wickwire Springs and Formed Wires
7. Claymont All-Welded Steel Girders
8. Wickwire Elevator Cable
9. CF&I Hardware Cloth
10. Wickwire Wire Rope and Slings
11. Wickwire Boom Pendants
12. Claymont Alloy Steel Plates
13. Gold Strand Insect Wire Screening
14. CF&I-Wissco TV Guy Wire
15. Perfection Door Springs and Quick Hitch Gate Springs
16. CF&I Space Screens
17. CF&I Galvanized Steel Strand
18. CF&I Prestressed Concrete Strand
19. CF&I Reinforcing Bars (in concrete)

THE COLORADO FUEL AND IRON CORPORATION

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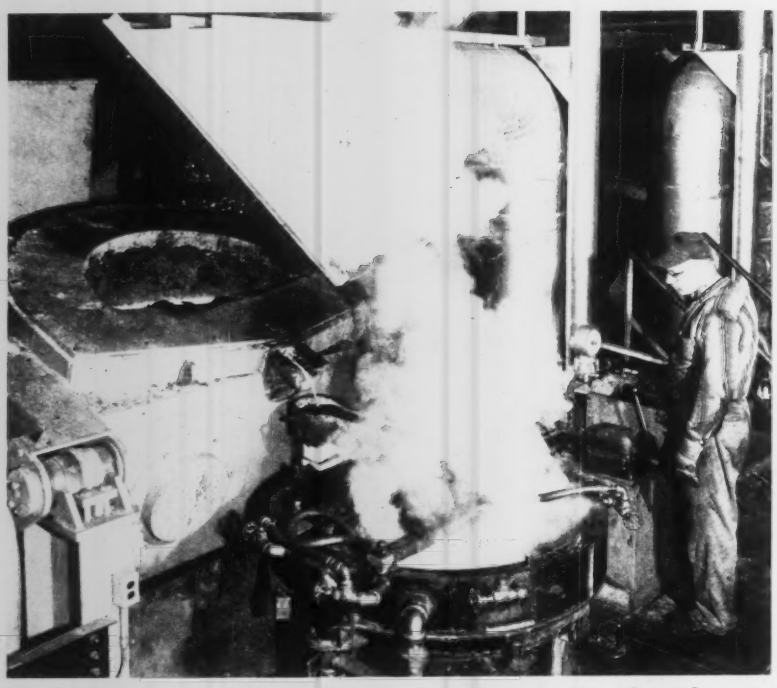


Everdur silicon-bronze slab is cast semicontinuously at American Brass Co.

Casting Method Upgrades Copper Billets and Slabs

It produces castings with uniform, fine-grained structures and without entrapped oxides, dross, and gases. Long castings and small cropping losses improve yield

SEMICONTINUOUS casting of copper and brass extrusion billets and rolling mill slabs at the Ansonia (Conn.) Div. of American Brass Co. promises improved metallurgical quality to users and fabricators of the red metal.

Steady casting conditions give uniform, dense ingot structure. Smooth metal pouring eliminates turbulence and entrapped oxides, dross, and gases. Rapid cooling produces a fine-grained, sound structure even in large cross sections.

• **Benefits to Casters** — Semicontinuous casting brings cost savings to casters through mechanized operation and larger ingot sizes that improve plant productivity.

The predominantly longitudinal solidification of the metal prevents piping and internal stresses. Longer casting lengths and small cropping losses improve yield.

• **Cast Many Alloys**—In addition to the common copper-base alloys, such as gilding metal, commercial bronze, red brass, low brass, cartridge brass, and yellow brass, American Brass Co. has semicontinuously cast leaded brasses, aluminum bronzes, and copper-silicon alloys.

The new casting installation comprises a series of machines built by Lobeck Casting Processes Inc., New York, each fed with metal from Ajax electric induction furnaces.

The machines produce multiple-strand extrusion billets up to 8 in. in diameter and rolling mill slabs to 6 x 24½ in., up to 12 ft long. Each station has its own hydraulic power unit which controls the speed of casting and the length of stroke.

• **Metal Cooled Rapidly**—In casting, the metal flows from the furnace spout along a launder to a distributor which insures splashfree entry of metal into the molds.

The metal is cooled in passing through the water-jacketed, bottomless molds and is solid by the time it leaves them. The molds are continuously filled with metal to match the withdrawal of the solidified castings until the ingots have been cast to required length.

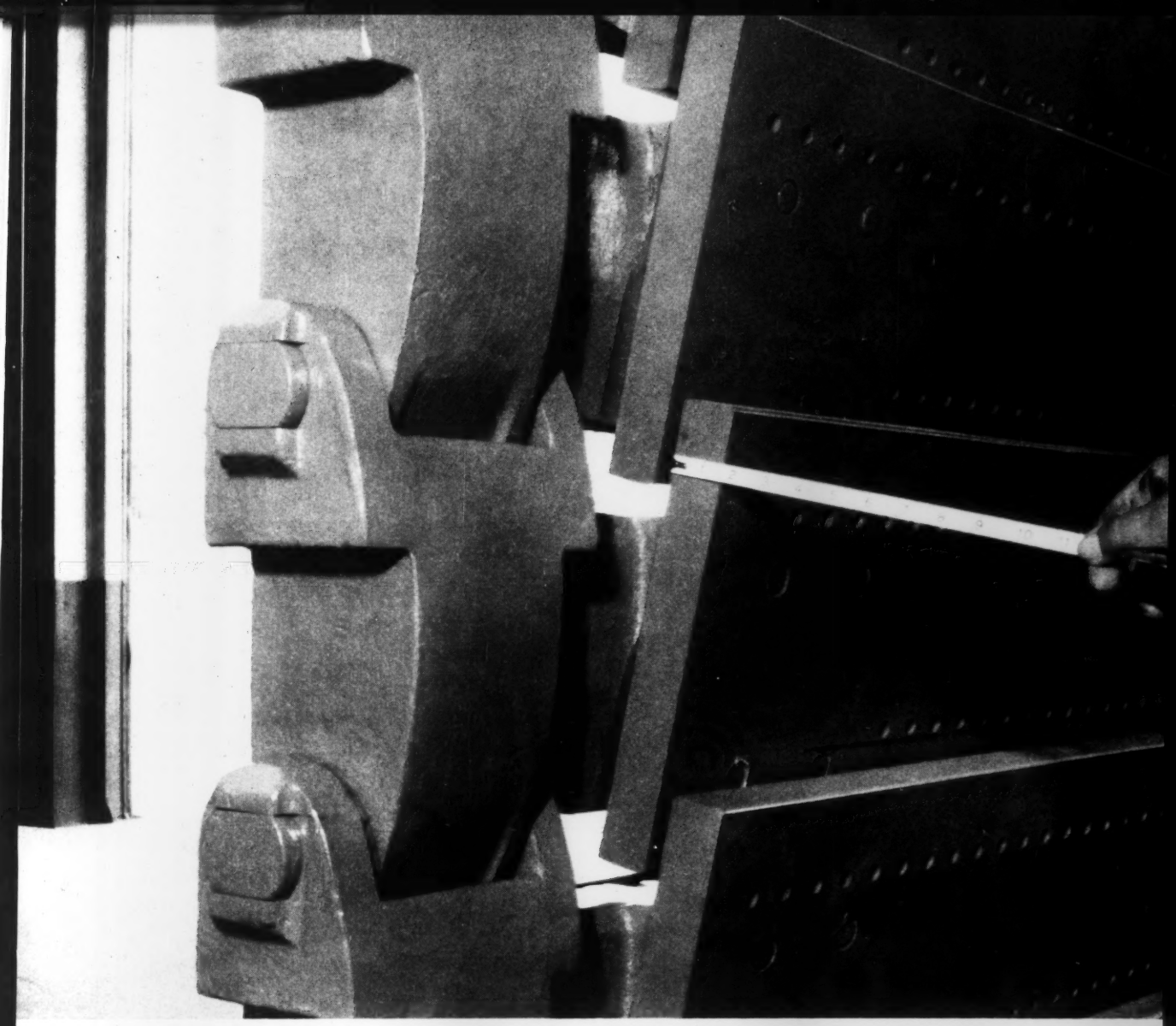
Rubber Stands Acids, Wear

Plating cylinders of a new, high-temperature hard rubber have withstood three years of handling hot corrosives and severe mechanical abrasion at Howard Plating Industries Inc., Detroit.

The tank material is Ace Tempron, a product of American Hard Rubber Co., a division of Amerace Corp., New York. The cylinders are part of a 26-station Udylite automatic barrel plater installed three years ago.

Tempron has good chemical resistance, high tensile strength, and a high distortion temperature (275° F). Those properties make it a good structural material for equipment and machine parts subject to chemical attack.

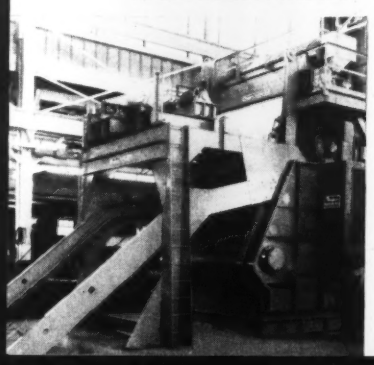
The duty at Howard is tough. Besides the hot corrosives, they must stand up to severe mechanical wear from tumbling of metal parts as they revolve during every step of the plating cycle. Because the average load is about 100 lb, cylinders in use three years have carried at least 2.5 million lb of work.



BUILT BIG . . . TO CLEAN BIG

Giant Pangborn unit Rotoblasts loads up to 12,000 lbs. in minutes!

A side view of the 72 cu. ft. Pangborn Rotoblast Barrel. Pangborn Barrels available in 1½, 3, 6, 12, 18, 20, 32, 72 and 102 cubic foot sizes



How do you build a giant blast cleaning barrel? If you're Pangborn, you use steel, inches thick. You put in the heaviest apron conveyor ever made. You incorporate the patented abrasive separator, abrasive-tight door, simplified Pangborn construction. You power it with two Rotoblast wheels that hurl *60 tons of abrasive an hour.*

Sure, it's tough to build . . . but it's worth it when you come up with a 72 cu. ft. Pangborn Rotoblast® Barrel! This unit cleans 6-ton loads *in five minutes* and gives the lowest operating and maintenance costs in the blast cleaning field! It's one of many Pangborn Rotoblast Machines. There's one for *your* problem.

The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And for complete information on Rotoblast Barrels, write to: Pangborn Corp., *1600 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning & Dust Control Equipment.*

Clean it fast with Pangborn ROTOBLAST®

Steel Mill eliminates Two Handlings

. . . Savings in 1½ months = total cost of SELAS heat processing equipment

Conventional practice of reheating blooms had been to remove them from the rolling process, charge them into batch-type reheating furnaces, soak them for 60 to 90 minutes. Blooms were then taken from the furnace, placed back onto the rolling mill table for final rolling.

At least 2 handlings of steel by mechanical manipulator were involved. It is generally agreed that picking up hot steel, transporting it 100-150 feet and setting it down, cost $2 per ton.

The following 15 economic factors prove that this steel mill's investment in Selas continuous heat processing equipment yielded immediate returns in reduced costs and improved product quality:

Material Handling

Selas continuous heat processing has eliminated both handlings . . . saved enough to pay for the heat processing equipment in 1½ months!

Product Value

The value of the material passing through this furnace line in only 26 hours equals the cost of the entire heat processing installation!

Material Saving

Because reheating time is 3 minutes instead of the conventional 60 to 90 minutes at 2250°F, less scale is formed. This amounts to a saving of 3 tons of steel per hour—enough to pay for the continuous furnace line in only 5½ months!

Fuel Efficiency

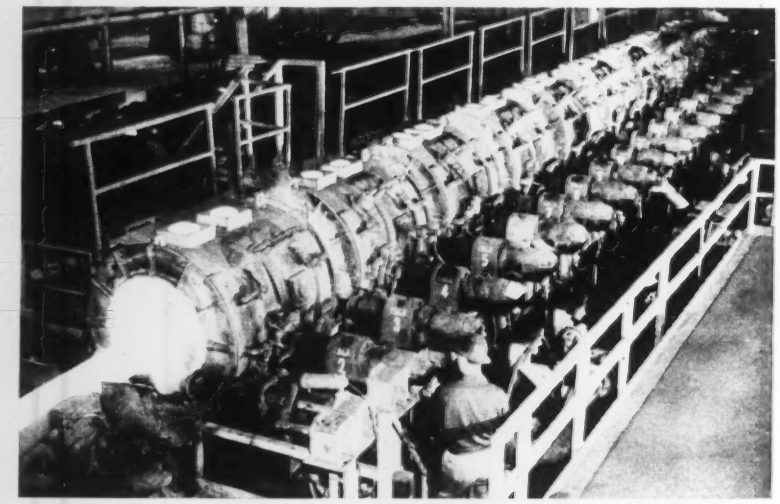
Fuel efficiency is not of major consequence because the total fuel cost is less than 0.6% of product value. Fuel efficiency could be increased through recuperation. Even if fuel efficiency could be increased by 50%, however, the cost of this additional equipment—plus higher maintenance—would add more to production cost than the 0.3% saved.

Automatic Operation

The furnace line accepts blooms at the charge-end whenever space is available in the furnace. Or, if no bloom is on the conveyor the furnaces automatically go on low temperature setting. Blooms, at optimum rolling temperature, are automatically delivered whenever required by the rail mill.

Temperature Control

Fast response of the Gradiation® furnaces permits accurate automatic control of bloom temperature. Uniform heating by radiant gas-fired Duradiant® burners produces optimum rolling temperature throughout every bloom.



Continuous Selas furnace line, located between a blooming mill and a rail mill, reheats blooms "on the fly," at rates up to 198 tons per hour.

Labor Requirements

None! Routine supervisory inspection of recording equipment is the total human contribution required.

Work in Process

Only 9½ tons of steel (maximum) need be in process to meet even the most widely varying production requirements. The previous method required 195 tons.

Product Quality

Reproducible metallurgical uniformity is achieved within each bloom and from bloom to bloom.

Equipment Flexibility

Furnace line heats blooms from 8 inches square to 11 inches square in cross-section, 8 to 22 feet long, weighing from 1744 to 9050 pounds each.

Maintenance

Simple, minimum. A stand-by barrel is quickly inserted into the line whenever major overhaul is necessary.

In 23 months of continuous operation, seven barrel furnaces have been re-lined, at a cost of only ⅔ cents per ton of reheated blooms. This is less than 0.007% of the value of product passing through the furnace line, and amounts to but 1.03% of the total original equipment cost.

Production Requirements

The furnace line can handle up to 198 tons per hour according to fluctuating demands of the rail mill.

Process Coordination

This continuous Selas line is an integral part of the roll conveyor between the blooming mill and the rail mill.

Floor Space

Valuable floor space was saved through Selas fast heating. This entire furnace line occupies only 63 x 11 feet.

Human Element

Automatic control and operation completely eliminate variables in product quality due to the human element.

* * *

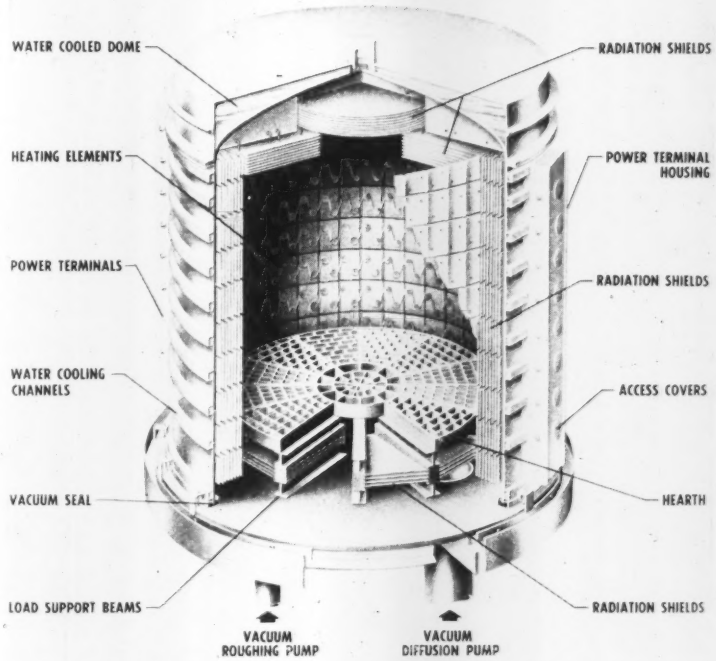
For case histories covering other steel mill heat processing operations, as well as heat treating, heating for hot working and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." Address Dept. 212, Selas Corporation of America, Dresher, Pa.

Gradiation and Duradiant are registered trade names of Selas Corporation of America.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers

DEVELOPMENT • DESIGN • CONSTRUCTION



Cutaway view of new type electric furnace details use of metal radiation shields

Metal Insulates Furnace

Since it uses no insulating bricks, a high vacuum can be quickly reached and easily maintained. Rapid heating and cooling cycles are characteristic of the unit

RADIATION shields of heat resisting alloy (in place of bricks) are used in an electric bell-type furnace developed by General Electric Co., Schenectady, N. Y.

The shields are arranged in layers of cylindrical shells on the inside walls of the heating chamber. Layers of the alloy sheets are also used in the top and bottom so that the material being treated is completely enclosed.

High vacuum, temperatures to 2700° F, and fast response in heat treat and brazing are obtained. The furnace is used mainly for heat treating superalloys of stainless steel and refractory metals such as titanium and zirconium.

The furnace casing has a water jacket to keep it cool enough to retain the strength needed to withstand atmospheric pressure while the workload is at high temperatures.

Losses due to convection are reduced by the vacuum. Protective gas atmosphere can be used.

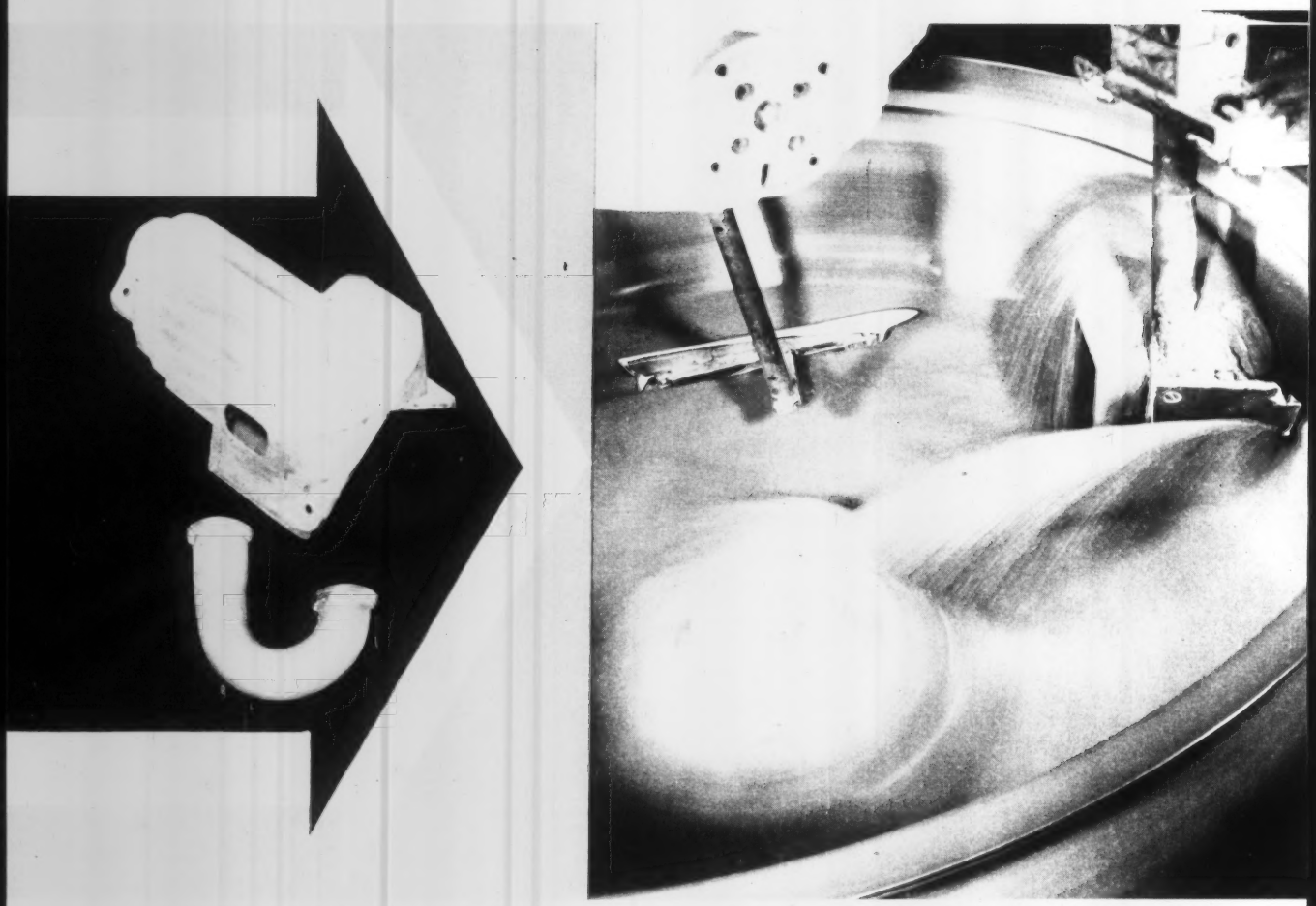
How do you measure the real cost of your heat processing?

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors encompassing your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment *now* in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality. (See case history on facing page describing continuous bloom reheating).

SELAS



Parts move through swirling loose abrasive to provide . . .

Quick Finishing at Low Cost

COMPLEX shapes can be finished quickly, at low cost, in one step with loose abrasives. Popularity of the process for many small decorative parts is growing.

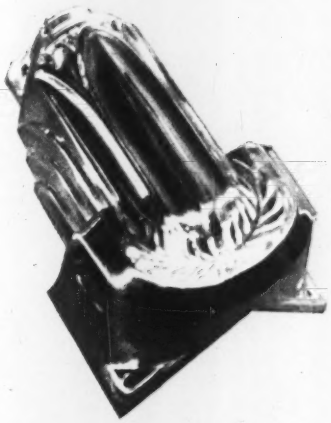
Reason: Today's high quality diecastings do not require prefinishing like castings of several years ago. (Surface defects are emphasized by loose abrasives unless they are first removed by spot finishing.)

Assuming quality of the casting is satisfactory, three factors determine if a part is suited to the process:

- Size—part cannot be large.
- Shape—should induce good abrasive flow.
- Strength—to withstand the forces of cleaning media.

• **Fixtures Are Important**—To realize the economy of the process, you must design positive holding fixtures that can be easily loaded and unloaded. They have to withstand the loads of abrasive flow and impact blows if parts break away. In some cases, it is important for the fixtures to back up the part to prevent distortion.

• **Finishing Methods**—Once a part qualifies from a design standpoint, the best process and type of machine must be selected. Three basic techniques are used: 1. Rotating an abrasive stream over and about the parts. 2. Revolving or pushing parts through a static mass of abrasive.



Advances have been made in process for polishing small parts. Here's a roundup on latest in equipment. Machines described can handle a variety of applications

3. Scrubbing parts with an abrasive slurry.

Materials used range from conventional barrel finish media, such as chips and steel balls for deburring, to special corn cob mixtures for polishing. Loose abrasives are used in the form of slurries, fluid chip masses, and moist or dry granular mixtures.

A variety of machines operate on these principles:

• **Mechamatic** — Mass production deburring and precision finishing is done by a machine built by Mecha-Finish Corp., Sturgis, Mich. The part is fixtured at the base of a spindle. Abrasive moves against the submerged part. The unit automatically rises and is water flushed before unloading the part.

Spindles rotate at about 8 rpm. They move with or against the flow in a revolving annular tub. Process time is controlled by the speed of the spindles and the tub.

• **Roto-Matic** — Operating on a similar principle is a machine made by Roto-Finish Corp., Kalamazoo, Mich. It is frequently used to finish aircraft turbine blades and buckets.

A series of 16 vertical spindles moves clockwise through the abrasive chips, water, and cleaning compound carried in the opposite direction.

• **Gyroburr**—A small finishing machine has been developed by Hyatt Div. of General Motors Corp. to deburr and finish bearing cages for low volume production or batch operation. The tub holding the abrasive is stationary. Parts (rotated at 75 rpm) are positioned at an angle to make them wobble. Process time usually ranges from 6 to 10 minutes.

• **Roto-Ram**—With this unit, parts are pushed and pulled through a static mass of abrasive. This technique is particularly suited to deburring and finishing long, slender parts like aircraft spars. Roto-Ram is also made by Roto-Finish Corp.

• **Burr-O-Matic**—A feature of this finisher is an oscillating head that pivots upward and back to facilitate loading and unloading parts. Two or more machines are coupled to finish long parts (up to 10½ ft). The unit is made by Speed-D-Burr Corp., Glendale, Calif.

• **Ger-O-Matic** — Universal Die Casting Div. of Hoover Ball Bearing Co., Saline, Mich., makes Ger-O-Matic for polishing parts before they are electroplated.

Normally, eight to ten rubber mats covered with fingers are submerged in an abrasive slurry to scrub part surfaces. Round fingers are used for recesses or ball-nose corners, square for flat surfaces.

• **Spin-Finish** — Parts are finished prior to plating in a machine developed by Grav-i-Flow Corp., Sturgis, Mich. The abrasive is granular and dry.

Parts are held in racks fastened to four spindles by a detachable coupling. Parts rotate clockwise while a main spindle moves counterclockwise half of the time, then the directions are automatically reversed.

Maximum part size is 6 to 9 in. Average time for the process (which lends itself to batch type production) is 6 to 9 minutes.

• **Gyrofinishing** — This method is used to finish metal surfaces before they are electroplated. F. T. Hall of GM's Technical Center reports the method originated from a fundamental study of barrel finishing and is based on the principle of reducing cycle time by increasing the relative movement between the abrasive and parts. Diecast parts are submerged in a revolving mass of free abrasive. Finishing is done in a few seconds.

Two types of gyrofinishers have been developed—vertical and horizontal. A typical vertical unit has three stations. While one head is unloaded and reloaded the others are in counterrotating drums. The superstructure is raised, indexed, and lowered, transferring the parts from station to station. Index time is about 15 seconds; cycle time, about 60 seconds.

Horizontal gyrofinishers eliminate the index time.

Parts are loaded on a conveyor-type fixture which moves through the rotating drum.

• **Operation Techniques** — To assure trouble-free operation of any of these units, it is important to have good preventive maintenance. Once a machine cycle is set for a particular application, a uniform finish will result if the abrasive is changed periodically and the quality of the preceding operations is maintained.

Loose abrasive finishing is a clean operation. Little or no ventilation is required. It is used to treat bronze, aluminum, cast iron, stainless steel, magnesium, titanium, and other metals.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

FROM A LITTLE VANADIUM . . . BIG RESULTS! How true. Just a "pinch" of vanadium produces big results in low alloy steels, large forgings, deep drawing steels. In high-speed and other tool and die steels it is indispensable. Keep in mind vanadium is one of the most *effective* addition agents you can buy. No other single alloying element can do so many jobs so well. What's more, you'll find that vanadium is plentiful and economical.

Vanadium also has wide uses in aluminum-base and titanium-base alloys, as well as glass, ceramics, inks, coloring agents, and in catalysts for synthetic textiles and petroleum refining. And now—High Purity Vanadium Metal is commercially available in many forms for research and the development of new products for the world of tomorrow. So you're missing an important bet if you don't find out for yourself about Vancoram Vanadium Products. Your VCA representative is ready to help you. Call him or write for information.

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Producers of alloys, metals and chemicals

Speed Control Permits Wide Range of Drive Settings

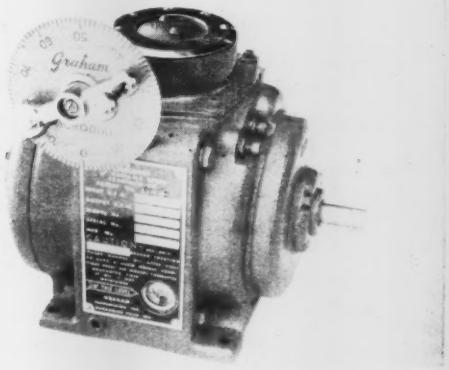
A micrometer dial that permits speed setting to 1 part in 4000 is available as optional equipment on Graham variable speed drives.

All speeds from any desired maximum to zero, and reverse, are provided. Speed can be adjusted with the transmission running or stationary.

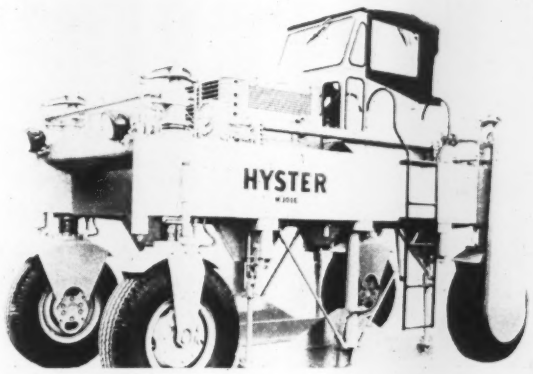
An improved antibacklash control linkage permits accuracies of speed holding and reset of the same order.

The unit is available without motor or with built-in motor. A variety of built-in reductions include single and two-stage in-line types and right angle work gear types with shaft horizontal or vertical, up or down.

The transmission is self-lubricated and has inherent overload protection. *Write*: Graham Transmissions Inc., Menomonee Falls, Wis. *Phone*: 3600



Straddle Carrier Provides Ease of Handling



Design of this 30,000-lb capacity straddle carrier permits more general use for carrying of bulky loads.

A four speed, full reversing transmission offers a wide range of speeds for varying travel conditions. In high, the truck travels at highway speeds. In low, the carrier can climb an 18 per cent grade fully loaded.

The carrier has power steering, four-wheel power brakes, adjustable seat, and all-weather cab.

Frame and body members permit good fore and aft visibility as well as a clear view of the load.

Each wheel is independently suspended on dual coil springs with heavy duty shock absorbers mounted between the wheel forks and the main frame. *Write*: Hyster Co., 1003 Myers St., Danville, Ill. *Phone*: 6-2400

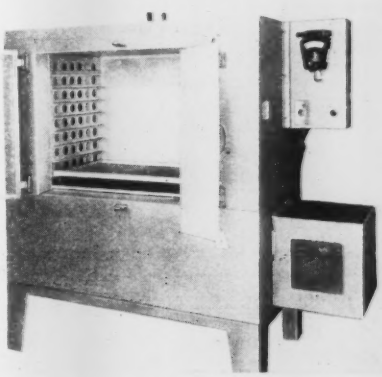
Ovens Designed for Laboratory and Production Use

Cyclo-Flow cabinet ovens are designed for precise laboratory and production operations. They come in horizontal and vertical styles.

Made in 500, 650, 850, and 1000° F series, hte ovens are equipped with standard heating chamber air velocity control from 200 to 600 fpm.

Included are an indicating temperature controller, low watt density elements, infinitely variable input controllers for matching heat input to load conditions, and adjustable exhaust vents and intake inlets.

An air flow safety switch gives positive protection in the event of motor, bearing, or fan failure. *Write*: L & L Mfg. Co., 305 Eighth St., Upland, Delaware County, Pa. *Phone*: Chester 2-5164



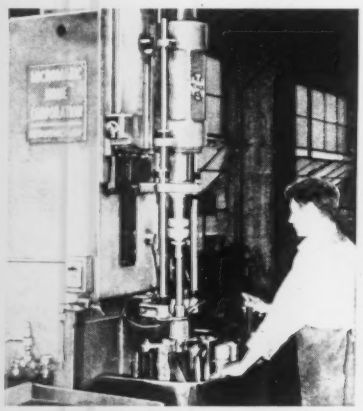
WHY MICROHONING*

OF GUIDE PIN BUSHINGS ASSURES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

Lamina Dies and Tools, Inc., a pioneer in the development of bronze-plated guide pin bushings (bronze is electroplated on hardened steel for combined strength and smoother action), required a processing method that would economically produce bushing bores having dimensional precision, accurate geometry, functional surface characteristics, and consistent duplication to exacting specifications in every bushing.

In developing processing methods for the bushing bores, Lamina engineers found that Microhoning is best for generating final precision and functional surface characteristics at lowest cost per bushing.

Bronze, bronze-plated or steel bushings from ¾" to 4½" in diameter are Microhoned on this Hydrohoner. Stock removal is from .001" to .003" and average unit cycle is 30 seconds. Machine is equipped with automatic size control and tool expansion.



Characteristic cross-hatch lay pattern

Why? Because Microhoning generates a round, straight cylinder along the neutral axis of the bore; size and geometry of bushings up to 2½" in diameter are held to .0001" tolerances; contact area between bushing and guide pin is 25% greater than obtainable by other final processing methods. In addition, the characteristic cross-hatch lay pattern generated by Microhoning provides a "built-in" lubrication system in each bushing bore. This combined with the clean-cut surface prevents seizure or scuffing during operation of bushing. Finally, the self-dressing action of Microhoning abrasives assures continuous cutting efficiency and identical geometry, dimensions and surface finish in every bushing bore.

Thus, Lamina realizes, through Microhoning's generation of quality surfaces and precision bores, the full performance potential of bronze, bronze-plated or steel guide pin bushings—longer life, smoother action, lower costs.

Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

*Registered U.S. Patent Office

MICROMATIC HONE CORP.

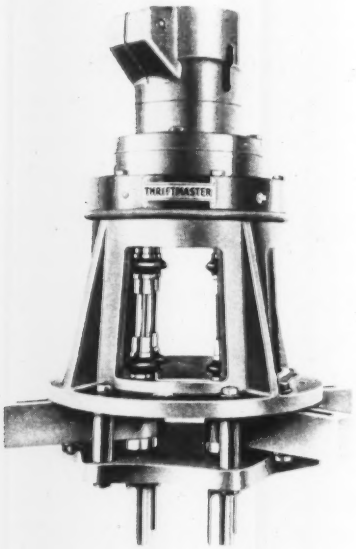
8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN

NEW PRODUCTS and equipment

Drill Heads Are Rugged

These universal joint type, adjustable drill heads have standard full ball bearing construction. The spindle brackets are precision machined for use with templates.

For close center distance work, they are available with spindle bracket assemblies having bronze radial and ball thrust bearings.

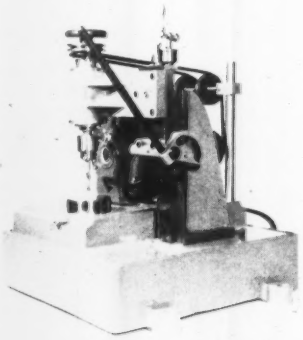


Two ranges of adjustment are provided with rated capacities of ½ in. drills in cast iron or steel. *Write*: Thriftmaster Products Corp., 1044 A N. Plum St., Lancaster, Pa. *Phone*: Express 2-2101

Unit Does Precision Work

This press does precision drilling where the drill has to be held accurately in a collet.

It is shown using a Jacobs #1A



drill chuck, but it can take standard Magnus-Elect collets with a maximum runout of 0.0002 in. Special accuracy collets can be supplied.

A micrometer screw in the column can be adjusted 2 in. in thousandths. *Write*: F. W. Derbyshire Inc., 157 High St., Waltham 54, Mass. *Phone*: Twinbrook 4-2900

Drives Screws and Nuts

The Auto-Torque Driver for screws and nuts has a minimum cycle time of 8/10 second, depending on the threaded distance. It is equipped with a built-in sensing mechanism and an adjustable-torque clutch.

The clutch is accurate within 5 per cent of the torque setting. Closer tolerance is available for special applications.

The part feeder requires no auxiliary motor or vibrator. *Write*: Dixon Automatic Tool Inc., 2300 23rd Ave., Rockford, Ill. *Phone*: 5-8756

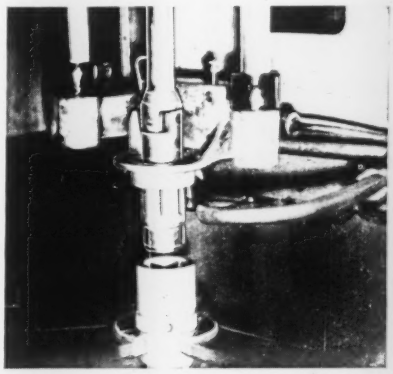
Controls Welders

The SWC-2X unit provides precise, rapid sequence, single phase control for resistance welders. It accurately sequences their functions

HOW MICROHONING* OF GUIDE PIN BUSHINGS PROVIDES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

HERE'S HOW Lamina Dies and Tools, Inc. uses Microhoning to generate final precision and functional surface characteristics in bushing bores at minimum cost.

Microhoning's low-velocity, controlled abrading technique removes a minimum of the bronze plating to obtain accuracy and functional surface characteristics. Thus, as much as possible of bronze plating is conserved and a uniform thickness of bronze throughout the bore is assured.



Above is a typical Lamina guide pin bushing. These bushings range in diameter from ¾" to 4½". An air operated, three-jaw fixture rigidly holds the work piece and is easily adapted to bushings of any size.

Because Microhoning tools have universal joints, they follow the neutral axis of the bore in generating round, straight cylinders. Since the bore location remains unchanged, concentricity between bushing I.D. and O.D. is obtained.

The combined reciprocating and rotating motions of the Microhoning tool creates on the bore surface a cross-hatch lay pattern that functions as a "built-in" lubricating system. For, the multitude of minute, diamond-shaped plateaus—over which the load is evenly distributed—are separated by a network of valleys that holds the lubricant. This better method of lubrication plus the clean-cut Microhoned surface prevent seizure or scuffing of bronze, bronze-plated and steel bushings. And, the self-dressing action of Microhoning abrasives maintains cutting efficiency to assure the same surface finish is developed in every bushing bore.

Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

*Registered U.S. Patent Office

MICROMATIC HONE CORP.

8100 SCHOOLCRAFT AVENUE · DETROIT 38, MICHIGAN

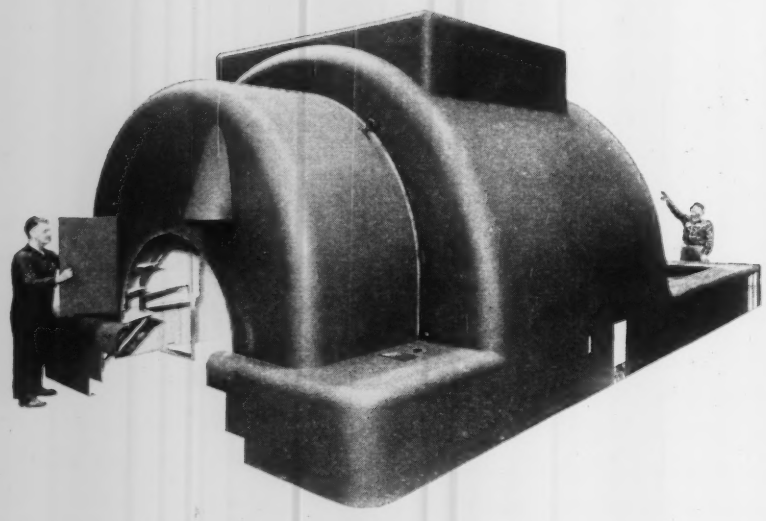
CUSTOM SHEET & PLATE FABRICATION

It takes modern equipment plus craftsmanship and know-how to produce fabrications such as the giant generator housing shown here—illustrative of Kirk & Blum's ability to produce the unusual as well as the conventional types of weldments. In its 170,000 sq. ft. plant, with crane capacity to 25 tons, Kirk & Blum has complete facilities to produce, preassemble and finish a wide variety of carbon steel, stainless, aluminum, monel and other alloys assemblies up to ½" thickness. Fifty years of exceptionally varied experience is your added assurance that the job will be done quickly and economically.

Send prints for prompt quotations or write for detailed literature: The Kirk & Blum Mfg. Co., 3226 Forrer St., Cincinnati 9, Ohio.

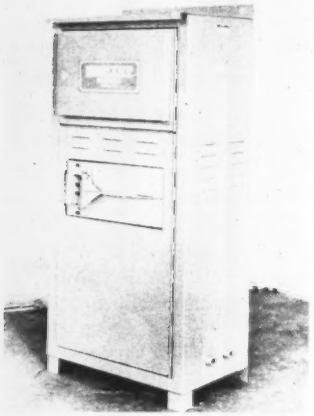
ELECTRICAL ENCLOSURES AND HOUSINGS
CONTROL PANELS AND DESKS
BREECHINGS • STACKS • AIR AND GAS DUCTS
CASINGS • LOUVERS • BINS • HOPPERS • CHUTES
INSULATING JACKETING
ALUMINUM AND ALLOY FABRICATION

KIRK & BLUM
FABRICATION



whether they are stationary or portable, or equipped with single or multiple welding electrodes.

Transistors and printed circuits are used in the timing and firing



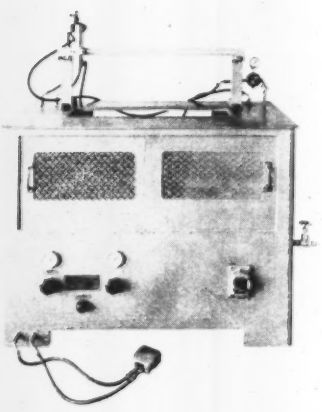
panels. The unit's electrical plug-in provides rapid and simple exchange of any timing or firing panel. *Write*: Dept. SWC, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill. *Phone*: Portsmouth 7-5600

Paint Sprayed Evenly

Even deposition of paint material over an entire workpiece is assured by this automatic spray painting machine.

The unit's positive mechanical reciprocating drive permits smooth gun travel with no pauses, even when the traversing guns reverse direction.

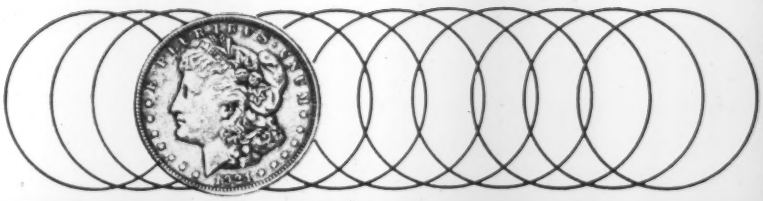
The guns paint in both directions, automatically shutting off at the



TRONIC NTROL STEMS

LEADERS IN NUMERICAL CONTROL

S-C STROMBERG-CARLSON



lowest cost contouring control

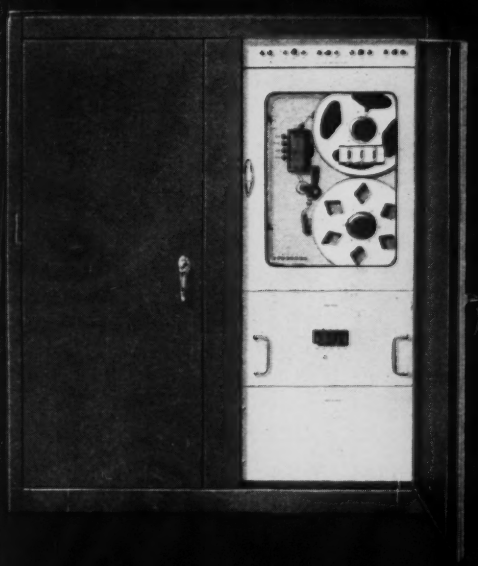
DIGIMATIC 191

CONTOURING CONTROL SYSTEM

Lowest cost machine tool contouring system now on the market, both in purchase price and operating expense. Simple to program and operate. Designed for everyday use in the average machine shop to shorten lead times, reduce costs, improve quality and increase output.

Fits medium duty tools... small boring mills, knee mills, profilers, lathes . . with feed rates up to 25" per minute. Cuts true circles, curves and straight lines with ±0.001-inch control accuracy. Eliminates spoilage, provides exact reproductibility, and drastically reduces machining time.

Write for 12-page "Digimatic 191 Systems" Catalog.



ELECTRONIC CONTROL SYSTEMS
Division of
STROMBERG-CARLSON
DIVISION OF GENERAL DYNAMICS CORPORATION
2231 S Barrington Avenue · Los Angeles 64, California

How to Sidestep Obsolescence

By upgrading plant equipment now, while demand is low, you can sidestep future obsolescence and be ready for tomorrow's production peaks. An important part of this program can be General Electric's new packaged, adjustable-speed drive—the Speed Variator.

Because of its wide speed range and precise regulation, it is ideal for modern, high-speed production. For example, in processing lines, rolling and tube mills, the Speed Variator maintains speeds automatically, accelerates and decelerates smoothly, controls tensions accurately.

New Amplistat Regulator and Static Exciter, standard on all new G-E Speed Variators, have no moving parts. As a result, maintenance costs are reduced.

To find out how the Speed Variator can help you obtain maximum drive flexibility, call your General Electric Sales Engineer, or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pa.*

813-19

Progress Is Our Most Important Product

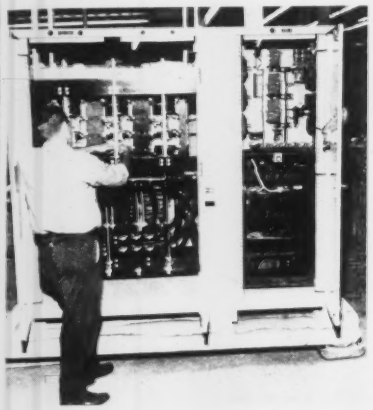
GENERAL ELECTRIC

NEW PRODUCTS and equipment

end of each stroke. *Write*: Conforming Matrix Corp., 345 Factories Bldg., Toledo 2, Ohio. *Phone*: Cherry 8-3518

Rectifier Water Cooled

A water-cooled silicon rectifier provides regulated or unregulated direct current for steel, electrochemical, plating, and other continuous processing lines.

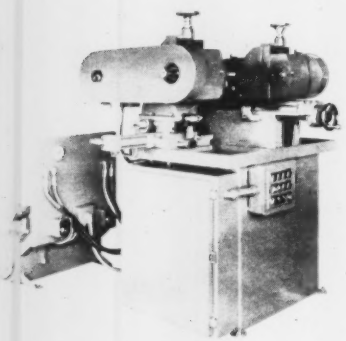


The unit uses saturable reactor-amplistat control to maintain the desired current level within ±1 per cent with unit efficiencies ranging from 90 to 95 per cent, depending on voltage rating of the equipment. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

Does Production Work

Variations of this duplex Half-Mill unit can handle slotting, sawing, face milling, keyway cutting, slab milling, boring, and many other operations.

The machine has a standard Hy-Flex hydraulic panel, two 2 hp, No. 40 taper spindle, heavy duty heads, and a combination of standard slides.



In production cycle, the opposed spindles rapid traverse toward each other, feed to depth, dwell, and retract. They stop automatically for safe unloading. *Write*: U. S.-Burke Machine Tool Div., Cincinnati Mfg. Corp., Brotherton Road and Pennsylvania Railroad, Cincinnati 27, Ohio. *Phone*: Bramble 1-5000

Lube Clings to Gears

A gear grease in pushbutton aerosol cans protects open gears, chains, cams, and wire rope. Gear-Lube Spray forms a tack surface shortly after spraying.

Under wet or dry, dusty or clean conditions, it clings to the frictional surfaces. Much of the constant replacement required with regular lubricants is eliminated. *Write*: Acrolite Products Inc., 106 Ashland Ave., West Orange, N. J. *Phone*: Orange 4-2558

Protects Electrical Units

Liquid Alconol-400 protects electrical and precision mechanical equipment against moisture, corrosion, and fungus.

It is applied by dip, spray, or brush over the entire electrical system, and will clean while it deposits a protective microfilm. Electrical characteristics of the system are unaffected.

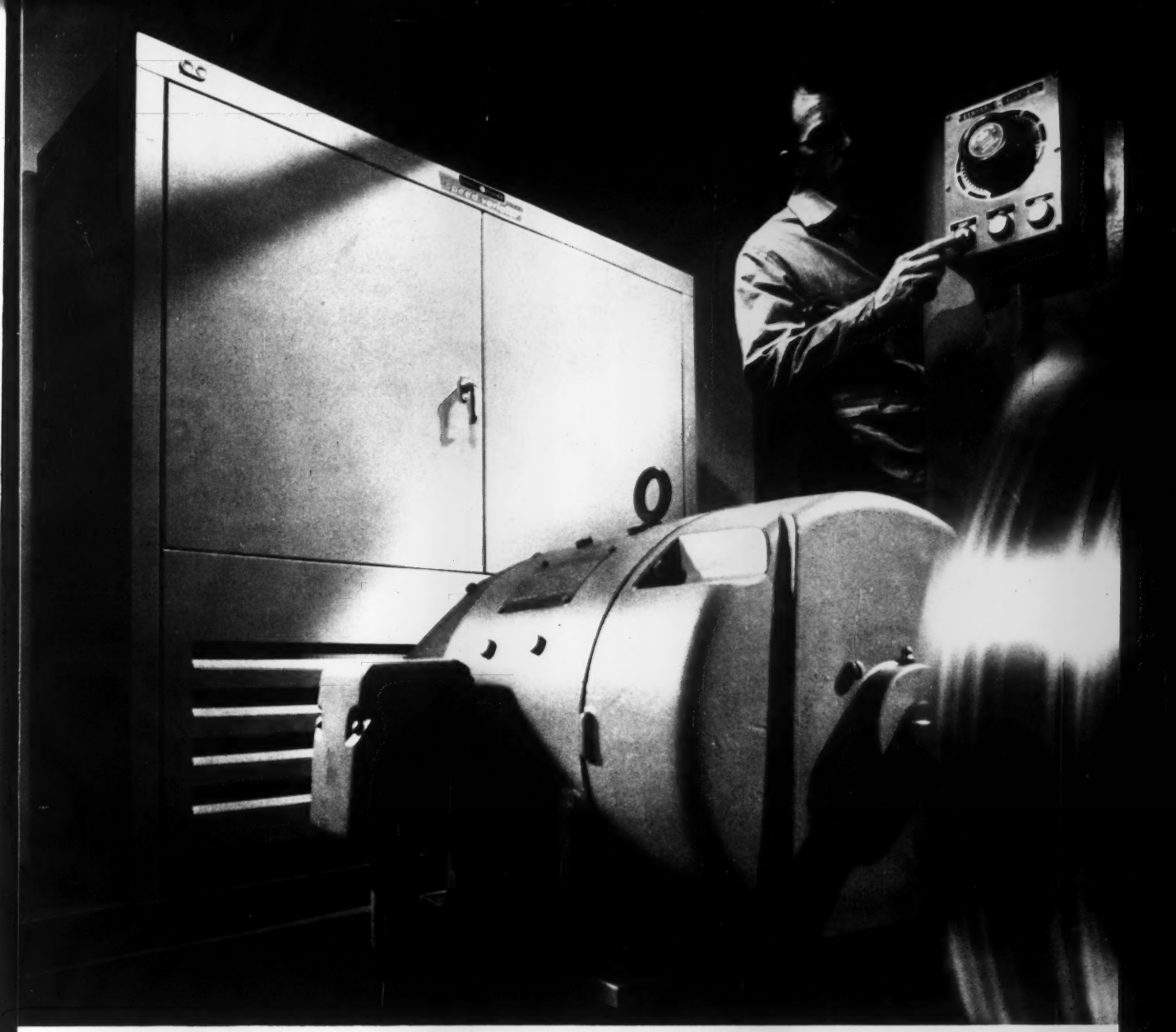
The film deposited is stable at 600° F, and will not crack or become brittle at −40° F. *Write*: Al-Con Chemical Co., Box 8168, New Orleans 22, La. *Phone*: Fairview 3715

Converts to Abrasive

The Model DL air operated, abrasive belt attachment converts any polishing and buffing head unit or lathe to accommodate abrasive belts.

A contact wheel is mounted on the head or lathe unit spindle and the abrasive belt is placed over the wheel and the idler pulley of the attachment.

Tension is accurately maintained regardless of work pressure or belt stretch. It can be operated at any convenient angle, and comes with



5 REASONS WHY YOU SHOULD BUY—

New General Electric Speed Variator

1. Amplistat Regulator offers better speed regulation and adjustable, timed acceleration for improved product quality.

2. Static Exciter, with silicon rectifier, has no moving parts, requires no warm-up, provides more production time, less maintenance.

3. Two-Unit, Four-Bearing M-G Set features Tri-Clad† '55' motor for more dependable performance.

4. Front-Connected Controls, recessed wiring troughs make routine inspection easy, cut maintenance time.

5. Kinamatic* Drive-Motors provide instant response to control signals. For details on this fast-acting motor see next page.

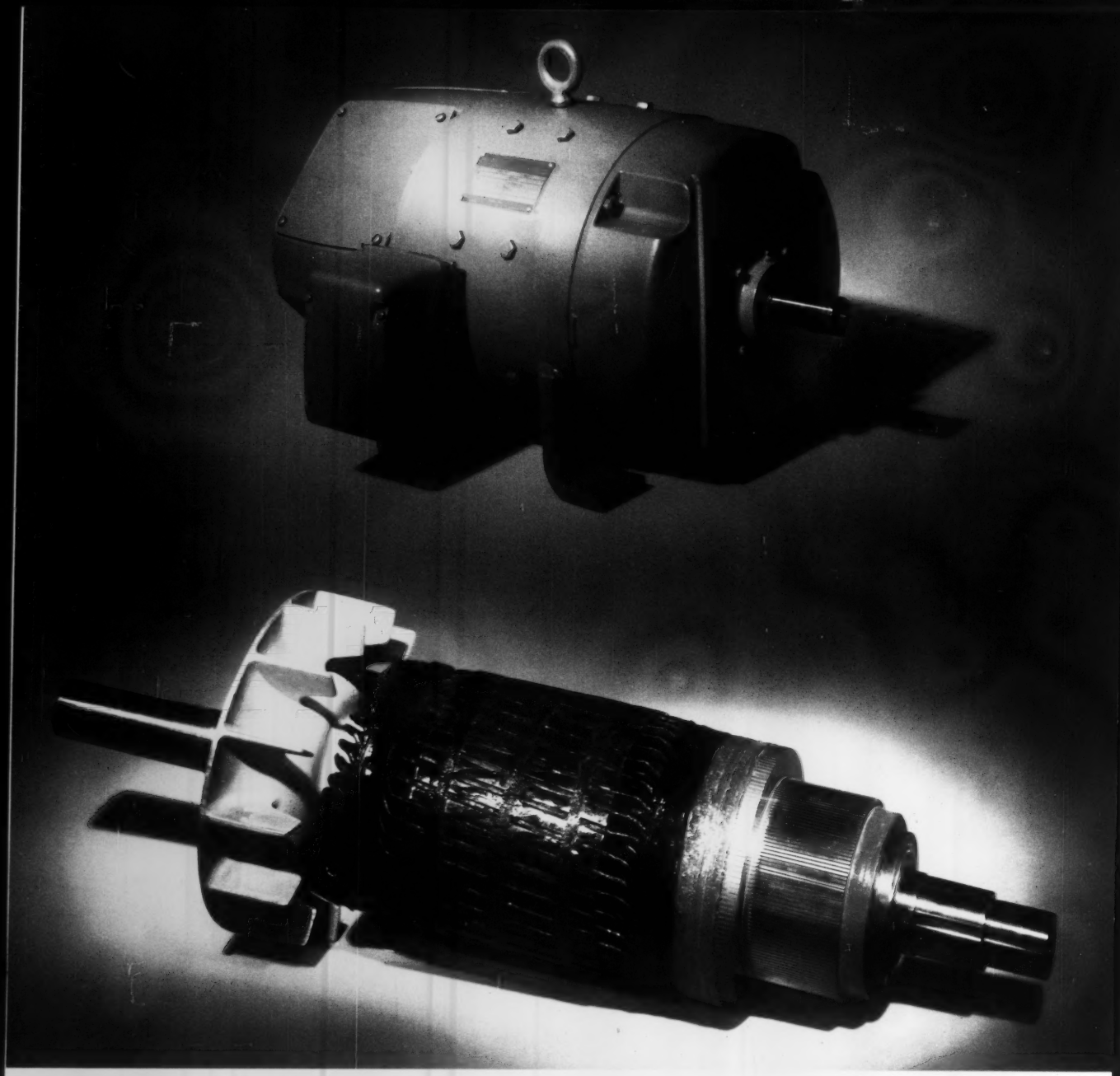
For more information contact your Apparatus Sales Office or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pennsylvania.*

In Canada, contact Canadian General Electric, Peterborough, Ontario.

† *Registered Trade Mark General Electric Co.*
* *Trade-Mark of General Electric Co.* 81-9

GENERAL ELECTRIC

More On Kinamatic Motors



NEW GENERAL ELECTRIC DC MOTOR GIVES

Instant Working Power

KINAMATIC* . . . a new standard in industrial direct current motors . . . designed to deliver drive power at the moment you need it!

Split-Second Response . . . larger air gaps reduce electrical time constants . . . smaller armature diameter permits more rapid delivery of torque to load . . . means faster starts, stops, reversals.

Low Inertia Armature is dynamically balanced, banded with steel and glass . . . gives dependable, high-speed operation . . . skewed armature slots minimize torque pulsation, permit smooth machine operation at low speed.

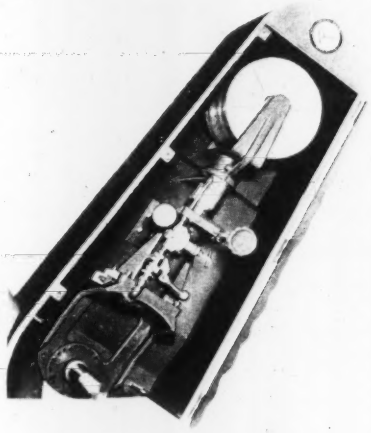
Other Power Packed Features of new d-c Kinamatic motors help give you more continuous, more automatic production . . . economically.

Additional information is available at your nearest General Electric Apparatus Sales Office. Or, if you prefer, write for Bulletin GEA-6355. *Direct Current Motor and Generator Department, Erie, Pennsylvania.* 813-9

*Trade-Mark of General Electric Company.

Progress Is Our Most Important Product

GENERAL ELECTRIC

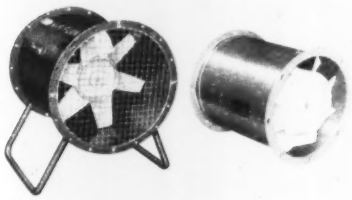


an airline filter and lubricator. The dust hood is optional. *Write*: Divine Bros. Co., Seward Avenue, Utica, N. Y. *Phone*: 4-7174

Fans for Industry

Pressure-type tubeaxial fans for industrial applications handle air, fumes, and light dusts. They are recommended for special machining operations.

The Type DT fans are equipped with matched design motors and propellers, and are available with propeller diameters of 8, 12, 16, 20, and 24 in.



Capacities range from 200 to 12,000 cfpm from free air to 5 in. static pressure. *Write*: Propellair Div., Robbins & Myers Inc., Springfield, Ohio. *Phone*: Fairfax 3-6461

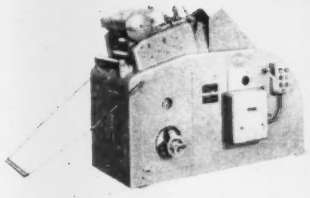
Speeds Multilevel Jobs

This Model 540 lift truck is equipped with 48-in. forks and a special fork adapter that permits lowering of load 84 in. below floor level.

Maximum lift is 12 ft, and overall lowered height is less than 8 ft. For added safety, the 6100-lb capacity truck is equipped with over-

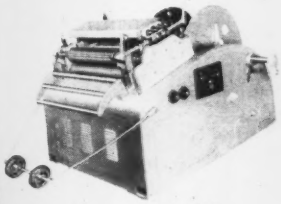
LITTELL

COIL CRADLE-STRAIGHTENER UNITS



No. 408H-C-20
CRADLE-STRAIGHTENER UNIT

Variable Speed Drive for Any Speed, 12 to 72 f.p.m. Cradle holds 2,000 lb. coils. 5-roll straightener handles stock 8" wide x .187" thick. Wider units for 42" wide x .046" thick. Available with Electric Clutch and Brake or with Oil Gear Drive. Some models of this size and type in stock for immediate delivery.



No. 638D-C100
CRADLE-STRAIGHTENER UNIT

Variable Speed Drive For Any Speed From 18 to 108 f.p.m. Air operated Cushion in Cradle eases coils up to 10,000 lbs. into position aligned with straightener head. 5 power-driven straightener rolls handle stock 14" wide x 1.87" thick or 42" wide x .125" in thickness.

SEE OUR CATALOG IN SWEET'S

HOLD Heavy Coils In Small Space

ALIGN Coil With Straightener

STRAIGHTEN At Any Speed

AUTOMATE All These Functions

All Standard Littell Cradle-Straightener Combinations have 6 to 1 Variable Speed Drives to supply straightened stock evenly at any speed within their range. Arm loop control automatically keeps proper slack in straightened stock moving to using equipment. Cradles handle any I.D. coils.

For High Speed — Sudden Stop Operation, an Electric Clutch and Brake can be furnished on the output shaft of the Variable Speed Drive. This feature eliminates starting torque strain. The Variable Speed Drive stays in running position, unaffected by the upward-downward movement of the loop control arm.

Oil Gear Drives can be furnished on these units for extra smoothness and arm controlled straightening speed within a range of 0 to 100 feet per minute.

Delivery is Good from the *larger* Littell Plant equipped to speed production.

USE THIS COUPON
or write for free catalog.

F. J. LITTELL MACHINE CO.
4189 N. Ravenswood Ave.
Chicago 13, Illinois
District Offices: Detroit, Cleveland

F. J. Littell Machine Co.
4189 Ravenswood, Chicago 13, Ill.
Send Littell Coil Cradle-Straightener Catalog Sections "C".

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COMPANY
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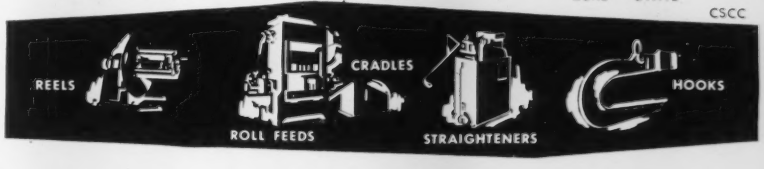
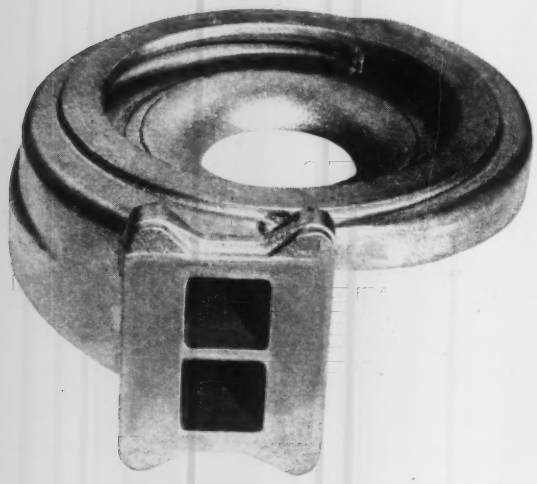
CSCC





SAVE WHEN THE HEAT IS ON

This 20 pound Ni-Resist casting made for the Schwitzer Corporation by Hamilton Foundry is the turbine casing of a diesel engine turbocharger. Exhaust gases which turn the impeller at speeds up to 90,000 rpm subject the housing to rapid cyclic temperature changes up to 1500° F. Any free scale formed at these temperatures could erode and eventually destroy the impeller blades. Ni-Resist was chosen for this part because it produces practically no free scale, it resists growth and oxidation at high temperatures, and it resists cracking under thermal shock.

Unit production costs are lowered by finding and using the most efficient material available. In this case, Ni-Resist castings combine design flexibility and machinability with long service life under severe temperature stresses. Ni-Resist castings from Hamilton Foundry have dimensional accuracy, uniform machinability, fine surface finish, a low rejection rate, and are delivered on schedule—a combination of factors which lower unit costs and insure Schwitzer's reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE ® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491

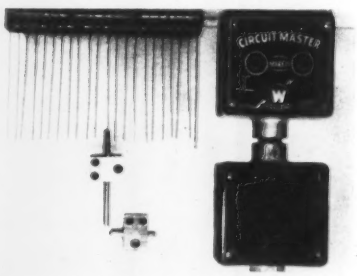
NEW PRODUCTS and equipment

head guard, plus transparent heat shield and drive tire heat shields.

Capacity and height-of-lift can be tailored. *Write*: Towmotor Corp., Cleveland 10, Ohio. *Phone*: Glenville 1-0900

Unit Stops Die Damage

This electronic Missing Parts Detector automatically disengages the clutch of a power press when a stamped part fails to eject, preventing breakdowns and die damage.



Used with the Circuit Master Mark III, the control provides non-ejection detection, overload protection, buckling control, end of material shutoff, and misfeed control. *Write*: Wintriss Inc., 20 Vandam St., New York 13, N. Y. *Phone*: Chelsea 2-0105

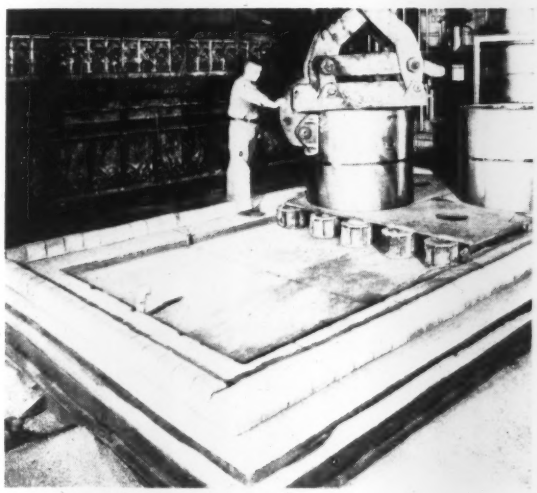
Grinds Special Point

This heavy duty Model No. 21 drill pointer extends drill size range for the Oliver point. Until now, this has been available only on the No. 510 pointer which has a maximum capacity of 3 in. in diameter.

The Oliver grinding technique permits a more intensive clearance

Four-stack strip annealing furnace with a capacity of three 30,000 lb coils on a 34 to 36 hr firing cycle, 68 to 78 hr cooling, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. The base, 9" thick hearth and portions of the curb are cast of B&W Kaocrete-A.

B&W Kaocrete-A resists CO disintegration and sand penetration at Granite City Steel



B&W Kaocrete-A is cast in the hearths and curbs of these furnaces where firebrick refractory was previously used.

Granite City Steel states that both bases have been in use for over three years without any disintegration resulting from the CO atmosphere. In addition, the monolithic structure of this B&W castable refractory eliminates the destructive effects produced by sand penetrating the joints and cracks of firebrick hearths.

For further information on B&W's specialized refractory castables, write for Bulletin R-35.

◀ Strip annealing furnace with a capacity of 70 to 80 tons per charge on a 24 to 48 hr firing cycle, 48 to 96 hr cooling cycle, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. 4½" lining of B&W Kaocrete-A is used on hearth and curbs.

B&W REFRACTORIES PRODUCTS: B & W Allmul Firebrick
B & W 80 Firebrick • B & W Junior Firebrick • B & W Insulating Firebrick
B & W Refractory Castables, Plastics and Mortars
B & W Silicon Carbide • B & W Ramming Mixes • B & W Kaowool

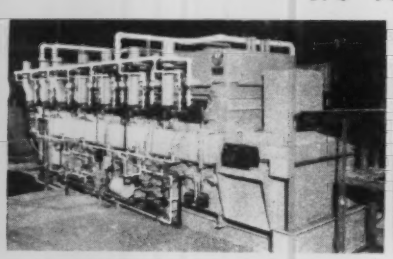
BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

R-595

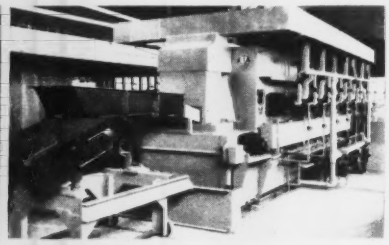
FURNACES

for continuous carbonitriding, carbon correction and scale-free hardening of small parts

175 TO 2000 LBS. PER HOUR



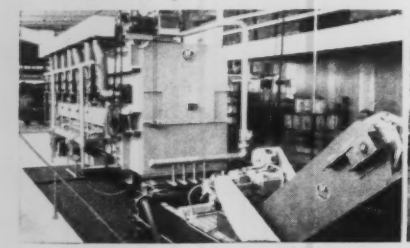
Carbonitriding, Carbon Correction, Carburizing, Scale-free Hardening and other Processes are Handled Uniformly, Economically and Continuously in EF Chain Belt Conveyor Furnaces.



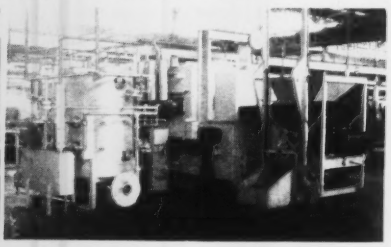
EF Gas Fired Radiant Tube Combination Hardening and Dry Cyaniding Unit Fitted with an Automatic Feeder that Distributes the Parts Evenly on the Chain Belt Conveyor; and a Dual Quench.

The EF chain belt conveyor furnace is one of the most satisfactory continuous heating units yet devised for scale-free hardening, carbon restoration, carbonitriding, carburizing and non-decarb heat treating small and medium size parts. The material is loaded onto our rugged heat resisting cast link conveyor belt; carried through the furnace; heated uniformly to proper temperature; automatically quenched and discharged. No pans or trays are needed. Hundreds in daily operation prove the dependability and efficiency of our design. 11 standard sizes. Capacities to 2000 lbs. or more per hour. Gas, oil or electrically heated. Furnished complete with any desired feeding, discharging or special atmosphere equipment. Write for folders describing our chain belt conveyor type and other production furnaces.

The Conveyorized Partitioned Dual Quench Moves Laterally to Permit either the Complete Oil or the Water Quenching Equipment to be Positioned under the Sealed Furnace Discharge.



This EF Special Atmosphere Unit can Operate as either an Exothermic or Endothermic Generator. Used with EF Continuous Bolt Hardening Furnaces for Scale-free Hardening or Carbon Restoration.



EF

ASK FOR BULLETIN 462-CB.

shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.

Send for a copy today!

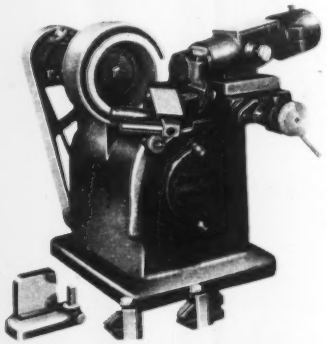
THE ELECTRIC FURNACE CO.

GAS FIRED OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio

Canadian Associates • CANEFCO, LIMITED • Toronto 13, Canada

NEW PRODUCTS and equipment



angle on the point as the drill web is approached.

Standard equipment for the unit includes $\frac{1}{4}$ hp motor, grinding wheel, diamond dresser, jaw assemblies, and setting gage. *Write*: Oliver Instrument Co., 1442 E. Maumee St., Adrian, Mich.

Strapping Shows Name

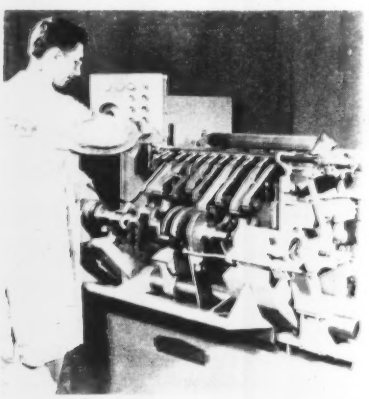
Printon strapping displays the name or message of the user every 2 ft. It is available in seven colors, and 19 light-duty sizes from $\frac{1}{8}$ x 0.012 in. to $\frac{3}{4}$ x 0.023 in.

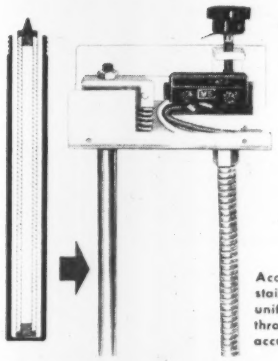
The product is made from high tensile steel strap, and the edges are deburred. *Write*: Allegheny Steel Band Co., P. O. Box 716, Pittsburgh 30, Pa. *Phone*: Walnut 1-7100

Laps Fine Finish

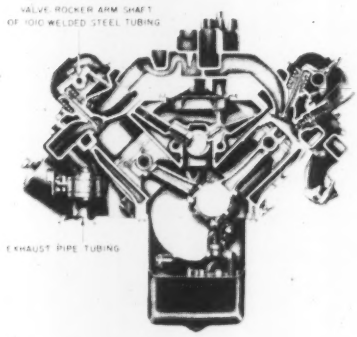
The No. 31 Crank-O-Lap crankshaft lapping machine uses coated abrasive strips to produce fine surface finishes.

It offers low cost production of fine surfaces on external diameters

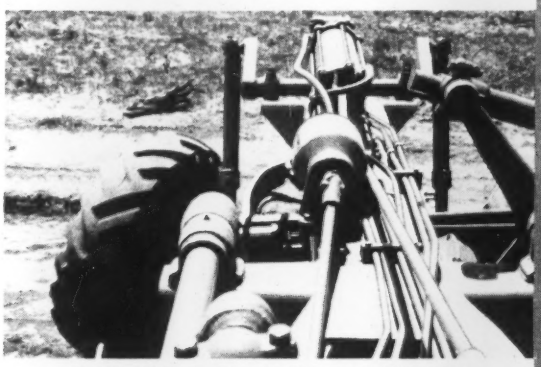




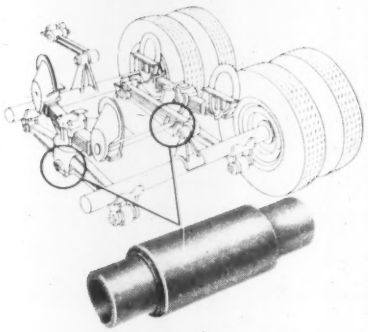
Accurately telescoped welded stainless steel tubing assures uniform temperature gaging through positive dimensional accuracy.



Mechanical parts such as hollow shafts or complex exhaust systems are served equally well by *welded* steel tubing.



Structural, hydraulic and mechanical applications for welded steel tubing show clearly in this roadbuilding equipment.



Dimensional accuracy of welded steel tubing makes this bushing economical, eliminates machining.

WHERE MECHANICAL EFFICIENCY MUST BE SERVED

Use WELDED TUBING

Carbon • Alloy • Stainless Steel

Only *welded* tubing combines the advantages of a tube's hollow form and structural strength with exceptional mechanical efficiency resulting from uniform wall thickness, concentricity, accurate dimensions and general adaptability to fabrication of all kinds.

Welded tubing is available from your quality tube producers in all weldable grades of steel in a full range of sizes.

It's time to design with *welded* tubing in mind!

FORMED STEEL TUBE INSTITUTE

Specific information on welded tubing is available on request to:

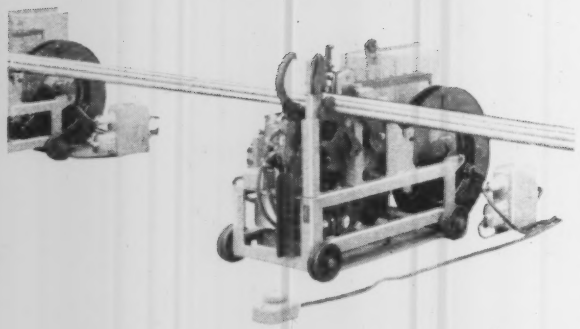
FORMED STEEL TUBE INSTITUTE

850 HANNA BUILDING • CLEVELAND, OHIO

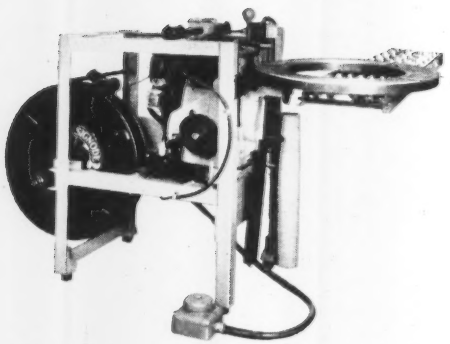
An Association of Quality Tube Producers

LC-583

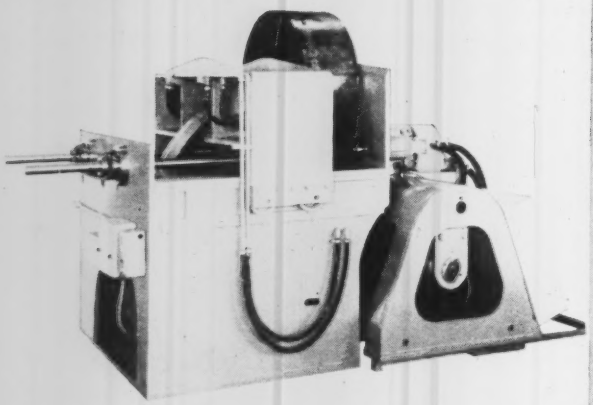
...proved in 73



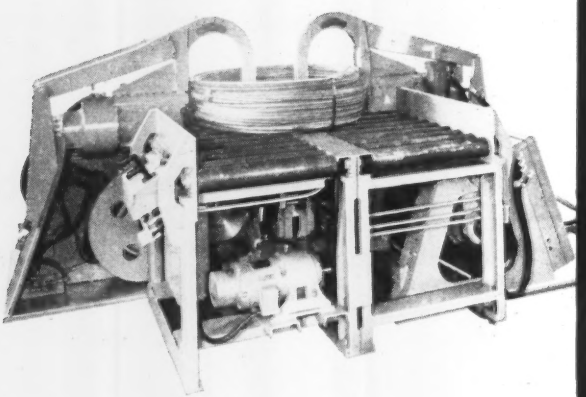
Signode MS2-B automatic strapping machines are used to bundle conduit, rods, tubing, and small dimension pipe. Usually two or three of these machines are used in line and operated from one control to apply two or three straps simultaneously. MS2-B automatic strapping machines can be adapted to handle and strap bundles of various shapes and sizes. Strapping operation is completed in four seconds.



The M2V machine straps narrow strip coils from ¼" to 2" wide. Each strap is applied in approximately 1½ seconds. Automatic and semi-automatic machines of the M2 series have been in steel mill operation since 1946, strapping conduit, rods, tubing, pipes, strip coils, mine roof bolts, and nail cartons.

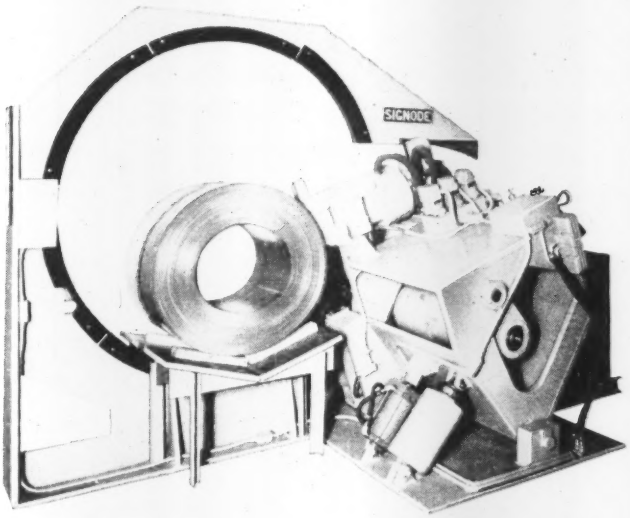


This MH10 series strip coil strapping machine will strap up to 120 coils per hour, three straps per coil. At the touch of a button, the machine tightens outer loops of the coil, squares up edges, positions the coil, and applies the strap to a pre-determined tension of up to 1200 pounds. Similar Signode machines have been in steel mill service since 1948... perform as well on hot coils—1200°F.



This dual automatic MH11 series strapping machine straps rod or wire coils up to 60" O.D. at 110 coils per hour. Machine applies single strap or applies two straps at once. Proper preset tension on every strap makes coils more compact, easier to handle, take less space. Signode wire coil strapping machines have been in steel mill service since 1949.

dependable steel mills



The Signode MH14-34 circumferential strapping machine is a relatively recent development. It automatically, and without adjustment for size, center-straps coils of from 30" to 60" O.D. Capacity is 300 to 400 coils per hour, depending on size. Coils can move through the machine in either direction.

SIGNODE machines reduce strapping and handling costs

The high cost of down-time in a steel mill puts a premium on machine dependability. Signode steel strapping machines have proved dependable—and productive—in 73 mills, some since 1946, in the hardest kind of service. Today's rising steel production gives additional importance to the savings these dependable machines deliver. Look to Signode for strapping machines built to steel mill standards.

SIGNODE

First in steel strapping

SIGNODE STEEL STRAPPING CO.

2645 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Fastener Facts

by Dudley H. Campbell, Director of Engineering—Judson L. Thomson Mfg. Co.

SHOULDERED RIVETS vs MACHINED PARTS

When design calls for fasteners that also function as pivots for moving parts, it pays to consider shouldered rivets first. They may look much like screw machine parts that offer similar shoulder and tenon combinations; but the similarity ends there.

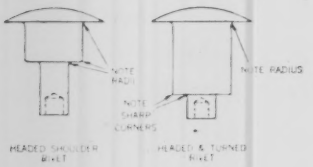
Rivets Cost Less!

Shouldered rivets cost only about half what you pay for their fully machined equivalents. That's because they can be cold-forged from solid wire in a single, high-speed operation. In most cases, no metal is removed, as with screw machine parts. So, you get all the stock you pay for.

Rivets Speed up Assembly!

Shouldered rivets are located and clinched by high-speed rivet-setting machines. Like semi-tubular rivets, they have shallow punched or drilled holes in their shanks to combine the shear and compression strength of solid rivets with low-cost fastening. On the other hand, comparable screw machine parts often require slow, costly hand locating and fastening.

Therefore, the savings in material and labor costs inherent in shouldered rivets demand their early consideration in cost reduction or value analysis programs. These low-cost, high-speed fasteners should be thoroughly investigated before designs are frozen in favor of more expensive screw machine parts.



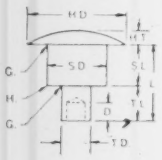
Thomson Shouldered Rivets

Thomson designs and produces shouldered rivets to specifications in two forms: completely cold-headed or cold-headed and turned, depending on permissible radius of corners and break of edges.

When close tolerances are not a factor as in folding baby carriages, car beds and seats, rollaway beds and comparable pivot-fastener applications, Thomson shouldered rivets are completely cold-headed . . . and, of course, priced at a minimum.

Where tighter fits are necessary, a secondary turning operation supplements the initial cold-forming to square corners and edges to specified tolerances. Metal removal, of course is slight. As a result, these Thomson shouldered rivets cost slightly more than completely headed rivets, but much less then fully-turned parts.

Variables to Consider



In addition to permissible radius of corners (H) and break of edges (G), there are nine other design factors: head shape, the diameter (HD) and thickness (HT); shoulder diameter (SD) and length (SL); tenon diameter (TD) and length (TL); rivet length under head (L) and hole depth (D). Head shapes may be round, oval, flat, countersunk, or some special design. Because of all these variables, Thomson Shouldered Rivets are made to order after individual quotations.

Other Design Factors

It pays to think twice before you rule out shouldered rivets because of design and production consideration that seem to prevent insertion of rivet-setting machine's driver or anvil for clinching the rivets. In many cases, a slight change in spacing or cavity size allows use of rivets without changing overall dimensions. In other cases, a change in assembly sequence permits a profitable switch from costly hand assembly of expensive screw machine parts to low-cost machine-set rivets. Our engineering department, experienced in shouldered rivet applications, will be glad to offer suggestions while your designs are still in the rough-draft stage—at little or no cost.

Materials and Finishes

Thomson Shouldered Rivets are produced from aluminum, brass, copper, nickel-silver, low-carbon steel, stainless steel and other materials. They can be plated with brass, cadmium, copper, nickel, tin, zinc, etc. They can also be oxidized or finished in japanned colors to match the original equipment or end product.

Free "Fastener Fact File"

Be one of the first to profit from our new manual on all phases of riveting. It covers rivet types, applications, materials, finishes and other factors that determine selection of the right rivet design and machine for cutting fastening costs. Request your copy today. Write: Judson L. Thomson Mfg. Co., Dept. S, Waltham 54, Mass.

JUDSON L. THOMSON MFG. CO., WALTHAM 54, MASS.

NEW PRODUCTS and equipment

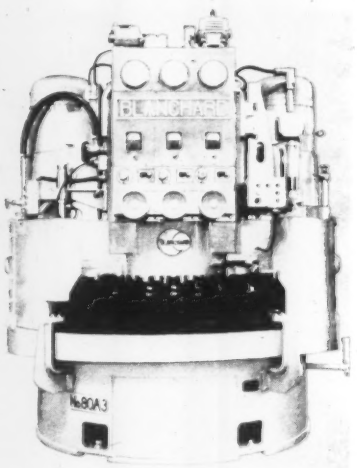
of automotive crankshafts. It can also be used to improve the finish on other types of parts.

Head and foot stocks are carried on a swing frame mechanism, facilitating loading and unloading. *Write*: Norton Co., Worcester 6, Mass. *Phone*: Swift 8-2511

Three-Spindle Grinder

The 80-A3 center column, automatic surface grinder has an 80-in. OD worktable and three grinding wheel spindles.

Each wheel is maintained at correct height by a finger-type feed control caliper. Work is held in fixtures during the grinding cycle. The table is nonmagnetic.



Wheels are 18-in. cylinders or 22-in. segments. Feed is manual or power with rapid raising or lowering of wheelheads by power. *Write*: Blanchard Machine Co., 64 State St., Cambridge, Mass. *Phone*: Trowbridge 6-8870

Drive Shaft Mounted

The 315GJ all-steel shaft mounted drive has a torque rating of 41,000 in.-lb at the low speed shaft. With a ratio of 25 to 1, the unit covers a range from 3 hp at 5 rpm to 30 hp at 50 rpm.

Features include extradepth, high pressure angle, helical gears with high load carrying capacity and maximum mechanical efficiency; and three-wall housing (all-steel) to maintain rigid alignment of re-

Now...MORE ball bearing types and a bright, new package

Hoover is widely known as a leading producer of open, shielded and sealed types of deep-groove ball bearings, double row bearings and water pump bearings. These Hoover products have earned a long standing reputation for quality.

Now, three new series are added to the Hoover line: 1) pillow block bearings and companion flange bearings; 2) 3L00 extra light bearings for maximum shaft and minimum housing dimensions; 3) "Super Max" bearings for maximum capacity applications.

All these new bearings meet Hoover's high quality standards. All are made with smooth *Hoover Honed* raceways and *Micro-Velvet* balls, accurate within millionths of an inch. All are designed for superior performance and long life.

New, too, is the distinctive blue and yellow package, designed to help you recognize Hoover bearings quickly and to remind you that they are *tops in quality*.

hoover

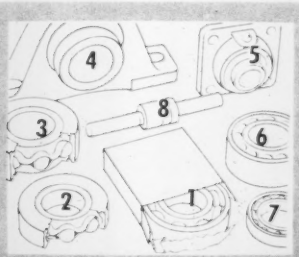
BALL AND BEARING COMPANY

5400 South State Road, Ann Arbor, Michigan

Los Angeles Sales Office and Warehouse: 2020 South Figueroa, Los Angeles 7, California

Chart at Right Identifies Bearings Pictured Above Use Squares to Check the Information You Want.

- ☐ **1** Single Row Deep Groove Bearing.
- ☐ **2** Lubricated-for-life Bearing with Seals of TEFLON*.
- ☐ **3** Cartridge Bearing.
- ☐ **4** Pillow Block Bearing.
- ☐ **5** Flange Bearing.
- ☐ **6** Double Row Bearing.
- ☐ **7** 3L00 Extra Light Bearing.
- ☐ **8** Fan and Water Pump Bearing.



Name _____

Title _____

Company _____

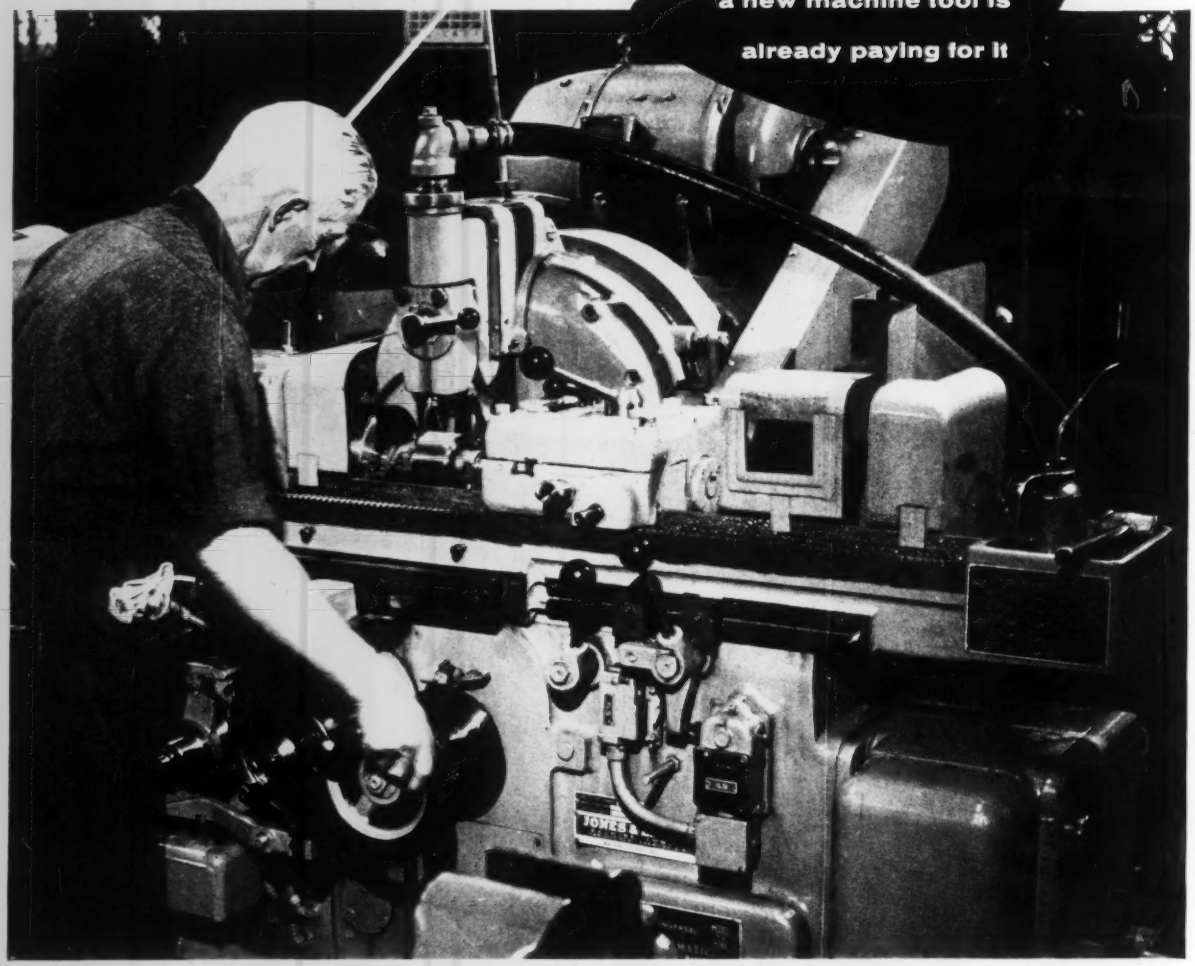
Address _____

City _____ Zone ____ State _____

Hoover Honed and *Micro-Velvet* are Hoover trademarks.
*TEFLON is a DuPont trademark.

JONES & LAMSON MACHINE TOOLS

the man who needs a new machine tool is already paying for it



Close Tolerance Tool Room Work on an Automatic machine with Universal Application

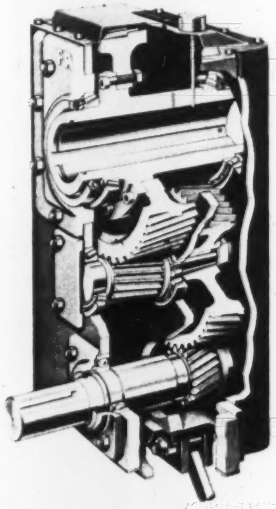
A customer writes: "The versatility of Jones & Lamson Thread Grinders is scarcely tested in the conventional production of hobs, taps, gages and threaded parts. In our toolroom, using the thread grinder as a basis for 'Rube Goldberg' development, we have produced precision racks, small form-profiled milling cutters, oil grooves and grinding wheel crushers.

"While serving the purpose as a necessary piece of equipment, this machine also provides a means by which many additional production problems can be explored and tested. Applying the thread grinder to toolroom problems is putting the best foot forward for quickly producing accurate and dependable shop accessories."

* * *

Write for catalog 600. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

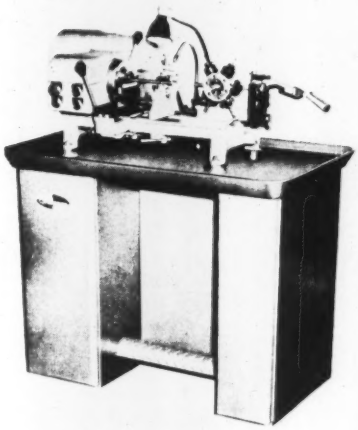
Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Thread & Form Grinders • Optical Comparators • Thread Tools



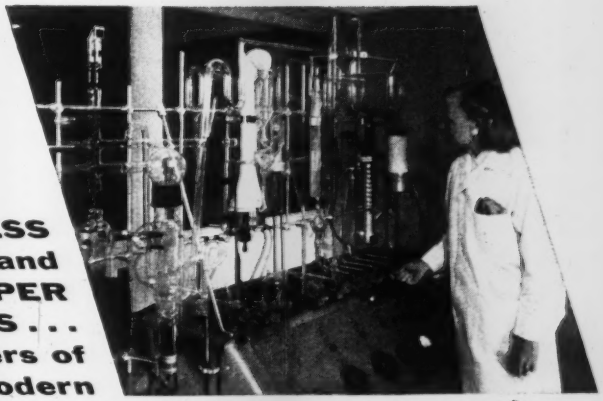
volving elements. *Write*: Dept. 255 Falk Corp., 3001 W. Canal St., Milwaukee 1, Wis. *Phone*: Division 2-3131

Lathe Has Rapid Indexing

A small turret lathe, the Challenge 625, offers accurate and fast machining of small parts. Its rapid indexing control enables the operator to return the turret to the starting position, regardless of the number of operations performed.

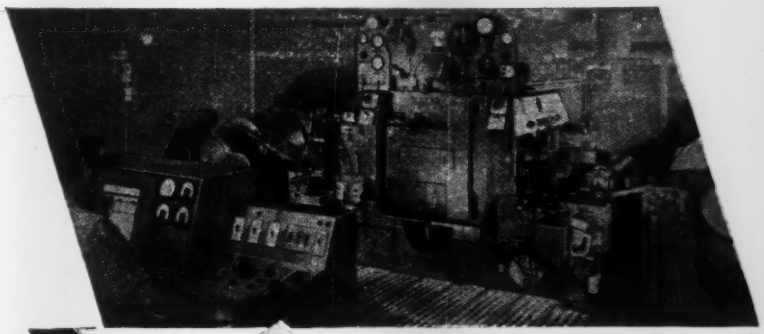


A steady rest permits accurate centering of parts to be machined. It is possible to hold parts within 0.0002 in. The steady rest opens and closes automatically at the start of the cutting cycle. Write: Challenge Machinery Co., Grand Haven, Mich. *Phone*: 2800



STAINLESS STEEL and SUPER METALS . . . workers of modern

miracles

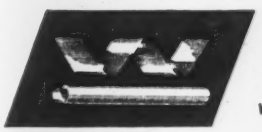


Stainless steel and super metals have so many desirable characteristics — corrosion resistance, strength, hardness, beauty, workability — they are often termed "miracle metals." But they can perform miracles *only if you select the right analysis for your particular application.* Wallingford is more qualified than ever to help you do this. Now, an all-new metallurgical laboratory and a larger staff of expert technicians are at your service.

In such fields as nucleonics, aviation and guided missiles, stainless steel and super metals will accomplish miracles *only when gages can be held to the close tolerances demanded.* Wallingford's Sendzimir Mills, equipped with non-contacting, continuous gages, assure this. A feed-back system provides fully automatic correction of the mills to maintain strip thickness with required tolerances at all times. These mills make Wallingford one of the few companies capable of producing precision strip in widths up to 27" and as thin as .001" . . . and give Wallingford the largest foil capacity in the country.

Investigate Wallingford's ability to provide stainless steel and super metals that will perform "miracles."

THE WALLINGFORD STEEL CO.



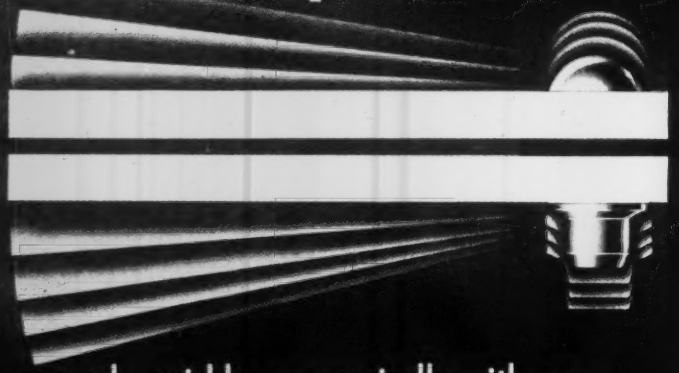
Progress in Metals for over 36 Years

WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP: *Super Metals, Stainless, Alloy*

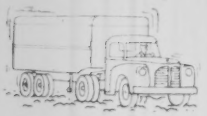
WELDED TUBES AND PIPE: *Super Metals, Stainless, Alloy*

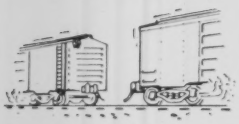
Vibration-proof joints

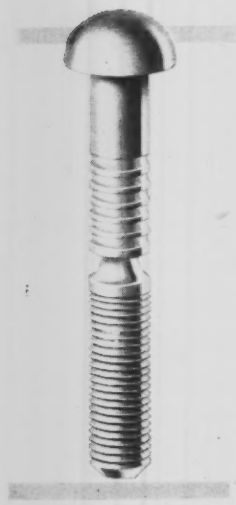


now made quickly, economically with new

TOWNSEND VERSA-LOCKBOLT







With the new Townsend Versa-Lockbolt* you get the same high tensile values as with the standard type but they cost less and are easier to install.

Wider grip ranges in a given size are provided by additional locking grooves. Other design changes make it feasible to use them in relatively oversized holes. Inspection time is reduced since hole size is less critical.

These features make for flexibility of design—make calculations simpler and more accurate.

Versa-Lockbolt installation is fast and guns provide uniform draw down or clinch—locking the collar with up to five tons of pressure. The new collar with its flanged integral washer makes it especially suitable for fastening even light gage materials.

For more information on how to get new vibration-proof fastening economy, write Townsend Company, P.O. Box 237-C, New Brighton, Pa.

*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307 2,531,048; 2,531,049 and 2,754,703

The Fastening Authority

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Cherry Rivet Division • Santa Ana, California

NEW literature

Write directly to the company for a copy

Immersion Heaters

A guide, GEA-6306, tells how to select immersion heaters for heating oil, and thermostats and controls for regulating oil temperatures. General Electric Co., Schenectady 5, N. Y.

Graphite Data

A comprehensive collection of technical data on manufactured graphite is in a handbook of engineering data. Graphs, tables, and curves relating to graphite's use in a wide range of industries are presented. National Carbon Co., a division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Tubeaxial Fans

Performance and dimension specifications on the Series 300 Tubeaxial Fans are available in Catalog 1110-B. Sturtevant Div., Westinghouse Electric Corp., Hyde Park, Boston 36, Mass.

Air and Gas Cleaning

Bulletin SC-1047 tells how Vape-Sorbers provide clean, dry air and gas for metal fabricators, steel plants, and other industries. Fourteen standard sizes are available. Selas Corp. of America, Dresher, Pa.

Marking Tools

Marking tools, machinery, and equipment are covered in Catalog No. 16 (192 pages). Sections include data on engraved stamping dies, type and type holders, and embossing and coining dies. Dept. S, Geo. T. Schmidt Inc., 4100 N. Ravenswood Ave., Chicago 13, Ill.

Hand-Operated Cranes

Specifications and capacities of the B-36 underslung single bridge, hand-operated crane are covered in a folder, DH-455-B. Units have capacities of 1 to 10 tons and spans to 50 ft. American Chain & Cable Co. Inc., 929 Connecticut Ave., Bridgeport 2, Conn.

Carbide Cutting Tools

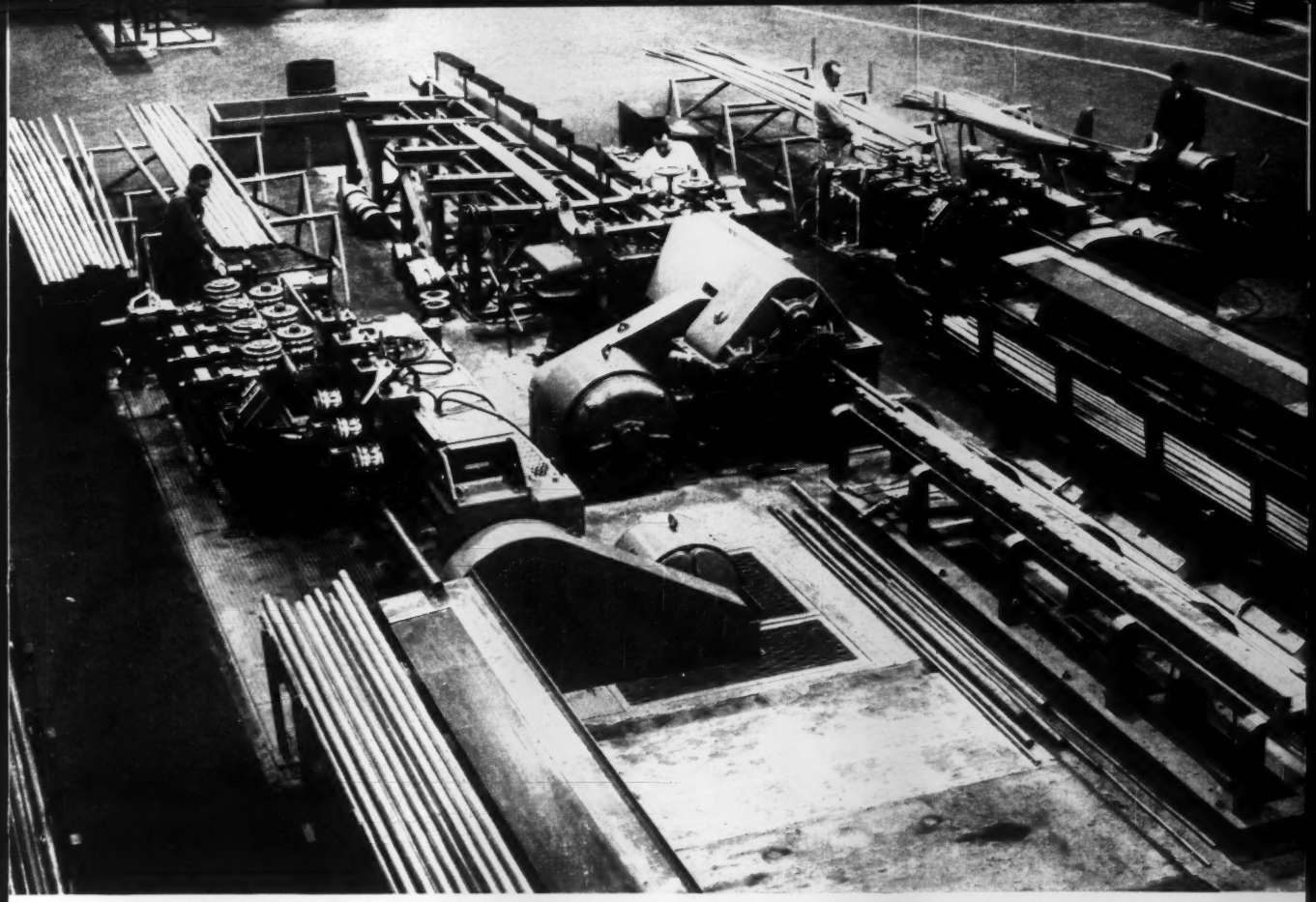
Carboloy cemented carbide cutting tool materials and a new pricing system are described in a catalog. Metallurgical Products Dept., General Electric Co., 11177 E. Eight Mile Rd., Detroit 32, Mich.

Boring Mills

Floor-type horizontal boring, drilling, and milling machines with 4 and 5 in. spindles, are described in a detailed catalog. Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.

Dust Collector

The Microdyne dust collector is a wet inertial type that is installed as part of the duct. Collection efficiencies are 95 per cent of all dust 5 microns in size



American Brass finishing bay equipped with Blaw-Knox Medart Straighteners.

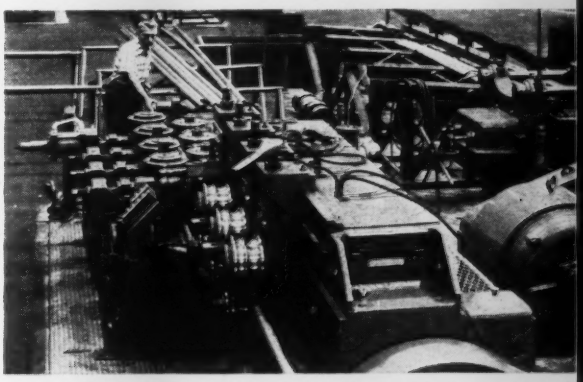
American Brass selects BLAW-KNOX

Medart Straighteners for its newest mill

The American Brass Company plant in Los Angeles is the newest and the largest copper and brass manufacturing operation in the West. To handle the entire output of their widely diversified product range, American Brass chose Blaw-Knox Medart Straighteners.

To handle the bulk of the tubing output, two high speed two-plane roller leveller type straighteners were used. These machines feature the patented Blaw-Knox Medart arrangement of overhung quick change rolls with variable roll centers. For work requiring exact precision straightness tolerances a 2-roll rotary type straightener is used.

The Blaw-Knox Medart installation in this modern metal-working plant is typical of the wide acceptance of Blaw-Knox Medart equipment, the most complete line offered in Bar and Tube Machinery for both ferrous and non-ferrous plants. Your Blaw-Knox Medart sales engineer will be glad to help you select the machine best suited to your product.



Roller leveller straightens brass tubing at high speeds.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
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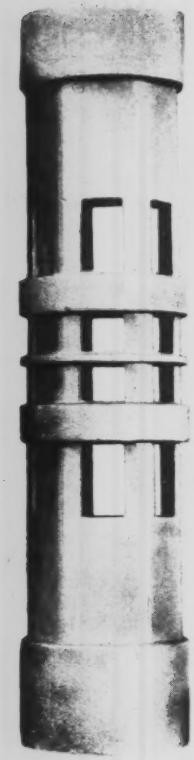

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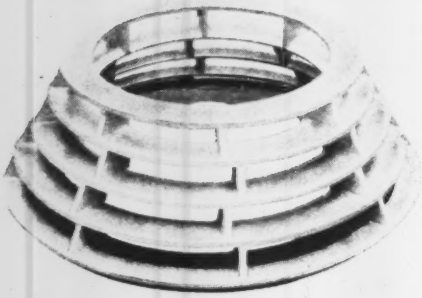

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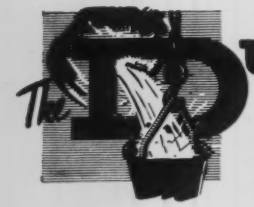

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CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

NEW LITERATURE . . .

(80 per cent in the 1 micron range). Bulletin J-616 gives details. Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.

Insulation

Cerafelt insulation provides heat control to 2000° F with only a fraction of an inch of thickness. This versatile refractory-fiber felt insulation is described in a folder, IN-200A. Johns-Manville Corp., 22 E. 40th St., New York 16, N. Y.

Ultrasonic Cleaners

Quality, mass produced SonBlaster ultrasonic cleaners are described in a catalog. Units range from 35-watt to 2.5-kw systems, with related transducers in capacities from ⅛ to 75 gallons. Narda Ultrasonics Corp., 625 Main St., Westbury, N. Y.

Optical Gaging

Over half the 114 pages in Catalog No. 10 are devoted to information on the technical subject of optical gaging. Optical Gaging Products Inc., Rochester, N. Y.

Portable Heaters

Portable space heaters are described in Catalog No. 5815. Stow Mfg. Co., 63 Shear St., Binghamton, N. Y.

Water Requirements

The reasons for the extreme water purity requirements in nuclear cycles, including considerations of efficient heat transfer, radioactivity, corrosion, materials of cycle construction, and fuel element fracture are discussed in Technical Reprint T-162. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

NEW BOOKS

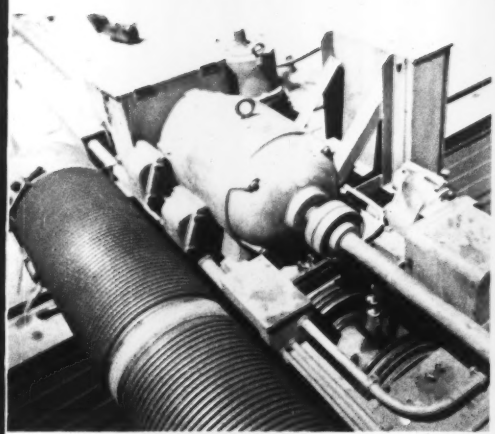
Standards of the Expansion Joint Manufacturers Association, Technical Committee of the Expansion Joint Manufacturers Association, 53 Park Place, New York 7, N. Y. 31 pages, $1

Up-to-date information concerning the design, construction, application, and testing of expansion joints for piping and other services are contained in this first edition. Much of the information has never been published in any text or reference book.

Elevated Temperature Properties of Chromium Steels, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 124 pages, $4.25

This report is a graphic summary of the elevated temperature strength properties for chromium steels. It includes data on tensile strength, yield strength, elongation, rupture, and creep properties. Twenty-three alloys, ranging from 12 to 27 per cent chromium, are covered. The book was prepared under the auspices of the Data and Publications Panel of the ASTM-ASME Joint Committee on Effects of Temperature on the Properties of Metals.

Norfolk and Western Uses Load-O-Matic for Heavy-Duty Car-Shop Production



50-hp hoist drive unit for this crane includes Westinghouse Life-Line® Motor, d-c self-adjusting brake and rectifiers.

At the Norfolk and Western Railway's main car-shop in Roanoke, Virginia, this modern 25-ton Whiting crane, equipped with Westinghouse Load-O-Matic* a-c control system, handles heavy plate and other materials for car manufacturing operation.

Because Load-O-Matic is a rugged, yet precision system built to heavy-duty industry standards, it is highly favored for applications that must have long-term, low-cost service, ease of operation and low-maintenance cost.

The Load-O-Matic system with stepless speed control over the full load range eliminates initial cost and complexity of d-c conversion equipment. Components, including controls, motors, brakes and gearing, are Westinghouse Power-Up products, built to work together and backed by Westinghouse unit responsibility.

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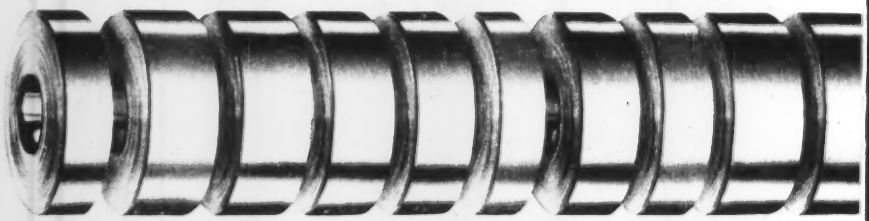

December 15, 1958

Supreme Court Aids Pipe Producers

LINE pipe shipments may jump 30 per cent next year, thanks to the Supreme Court. Last week it gave natural gas companies all the encouragement they needed to resume expansion programs that were suspended 13 months ago (see Page 85). By reversing the "Memphis decision" of November, 1957, it restored their authority to raise rates without first obtaining the consent of all their customers.

Hit by recession as well as by the Memphis decision, line pipe shipments have plummeted from last year's record high of 4.2 million tons to this year's estimated 2.6 million. The outlook for 1959 is encouraging, but few producers think more than half the lost ground will be recovered. Full impact of the court's ruling won't be felt until 1960, when shipments may set a record.

OIL COUNTRY PICKUP?— Manufacturers of drill pipe, tubing, and casing hope the revival of interest in pipeline programs will also mean better business for them. They believe gas producers will have to drill more wells to supply their expanding markets. Drillers' inventories of the popular sizes of tubing and casing are thought to be abnormally low.

A rally seemed to be in the making before the Memphis reversal was announced. Tubemakers say oil country business has perked up markedly in the last two weeks. Three major oil companies have indicated that they'll start buying for inventory next month. They fear a midyear steel strike and subsequent price hikes.

ALCOA'S MOVE WEIGHED— The announcement by Aluminum Co. of America that it won't change its prices through the first half of 1959 is welcome news to steel consumers. They figure it will discourage any plans to hike extras in January or February—a move that has precedent.

AUTO UPTURN CONTINUES—During the final third of November (seven selling days), auto dealers sold 129,500 new cars. Their daily average of 18,500 was 14 per cent higher than that of the middle third of the month and the best of any like period in 1958. Dealers said their sales improved because they were better stocked. For the first time, they could offer buyers a full selection of models and colors.

Automakers are continuing to boost their production. They hope to turn out 600,000 cars this month. Although they're still buying steel on short leadtime, there's talk of inventory building. It's believed that one of the Big Three will soon place orders for March and April delivery.

TIN PLATE SNAPS BACK— Tin plate shipments fell sharply last month as consumers worked off inventories they accumulated in anticipation of a Nov. 1 price increase. November shipments from one mill were only a third as large as October's. Another producer's shipments dropped to less than 30 per cent of the previous month.

December business is on the upgrade. Can companies are buying for January production. Their October purchases were limited by two considerations: 1. They didn't want to invest too much money in a stockpile. 2. They didn't want to pay heavy taxes on a big yearend inventory. Shipments of electrolytic tin plate will reach a record high this year: About 5.4 million tons.

PRODUCTION INCREASES— Last week, steelmaking operations advanced 1 point to 75.5 per cent of capacity, the highest point of the year. Production was about 2,038,000 net tons of steel for ingots and castings.

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*Current prices were published in the Dec. 1 issue and will appear in subsequent issues.

This resistance welder has 48 Aeroquip Hose Lines giving long, trouble-free service conveying hydraulic fluids. Hose lines were made up in the plant using Aeroquip Hose and Reusable Fittings. No special machines are needed to assemble Aeroquip Hose Lines. Assemblies can be made in minutes using a wrench and a vise.

Aeroquip Hose Lines Give Long Service on Plant Equipment

at Hayes Industries, Inc.

Use of Aeroquip Flexible Hose Lines has increased service life of hydraulic and air lines on plant equipment at Hayes Industries' Jackson, Michigan, plant. Replacing steel tubing on one hydraulic machine, Aeroquip Hose Lines have given trouble-free service for more than 4½ years.

All replacement hose lines are assembled quickly right in Hayes' plant from Aeroquip Bulk Hose and Reusable Fittings. Equipment downtime is minimized and hose line stock is limited to a few coils of hose and spare fittings.

Standardize on Aeroquip Hose Lines for your fluid line replacements. You save time and money. Call the Aeroquip Distributor listed in your Yellow Page Phone Book or write us.

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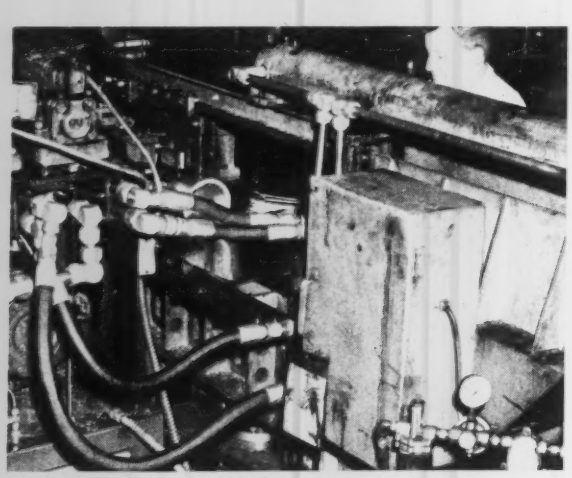
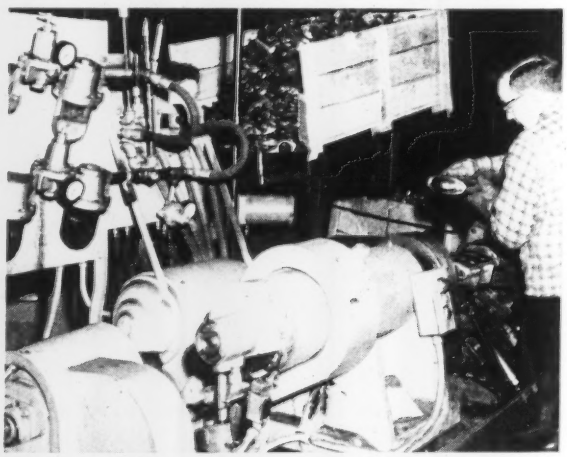
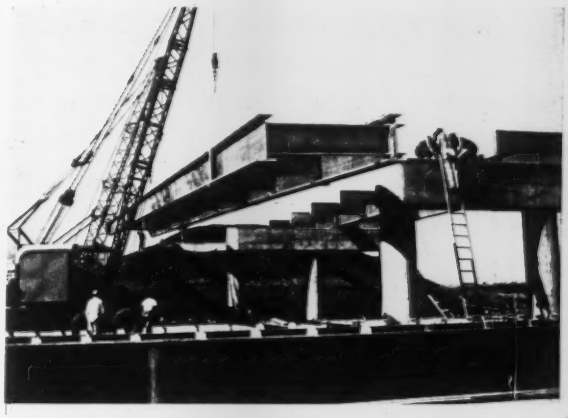


The high pressure hydraulic lines on this lock seam machine replaced steel tubing over 4½ years ago and are still in good condition despite constant vibration.



Air lines on this head roll machine in Hayes' Jackson plant are Aeroquip medium pressure and high pressure hose lines. They withstand air surges and vibration.

From rugged military vehicles . . .



To modern highway bridges . . .

Structural Aluminum Begins To Move

WATCH aluminum structurals. This market, a mere sprout in the late 1940s, is ready to burst into full bloom.

Its size (probably less than 5 per cent of aluminum shipments) can fool you. The best way to gage the future of these products (including heavy sheets and plates, I-beams, T-sections, and channels) is to look at their application potential.

Here are some present uses:

• **Bridges**—Last September, the Iowa State Highway Commission dedicated the world's first aluminum girder highway bridge (see photo at right above). Measuring 222 ft, it's all aluminum except for the concrete deck. Several similar bridges are going up elsewhere. Most industry people feel the big potential is not in using aluminum as a replacement for steel bridges. They hope to realize their goals by designing units for aluminum. Both the Fairchild bridge and Reynolds-Baroni bridge express that philosophy. They were introduced within a few weeks of each other this year (see STEEL, Sept. 1, p. 30; Oct. 27, p. 136).

• **Electric Utilities**—A prefabricated, all-aluminum substation was pioneered last spring by Kaiser Aluminum & Chemical Corp. Aluminum Co. of America has contracted with a New Jersey power company for 60 all-aluminum transmission towers, the first such application for the light metal.

• **Transportation**—Aluminum has more than surface penetration in this field. Some examples: Truck and trailer bodies, military vehicles, aircraft, railway tank, gondola, and hopper cars.

Other uses are numerous. They include: Building girders and other structural components, conveyors and cranes, oil well drilling platforms, building dome structures, storage tanks, framing for exposed structures such as bus and train station shelters, ship hulls, and deck houses.

• **Selling Points**—Why use structural aluminum? The industry's answer: Lightness, corrosion resistance, ease of fabrication, high resilience, and impact resistance. Because aluminum can be extruded, another talking point is "the ability to achieve stronger sections through more efficient design of the shape in the section." For construction applications, producers also cite: Simplicity of erecting prefabricated sections, simpler and less expensive transportation of materials to the job area, and ease of joining. In electrical structural uses, you get the added arguments of reduced maintenance, greater safety, and simplified grounding. Aluminum truck marketers talk about increased payload, less downtime, and high strength to weight factors.

• **Welding Is Key**—The aluminum structural market owes its rapid progress mainly to the development of high strength weldable alloys and to the perfection of inert gas, shielded arc processes. Aluminum people believe its potential will grow even more as refinements and advances are made in welding techniques.

Other technical breakthroughs should not be overlooked. Aluminium Ltd. Sales Inc. says: "Large rolling mills and extrusion presses have made it possible to meet demands of designers which could not have been fulfilled until a few years ago." Kaiser cites new and larger lock bolts for field joining as an engineering advance that will buoy structural sales.

Also contributing to growing acceptance is the availability of sheets in widths over 100 in.; plates over 1¼ in. thick, with widths up to 120 in.; and extrusions which can be produced within a 20 in. circle.

• **At Whose Expense?**—Where aluminum structurals are used, they generally replace steel. Sometimes

timber or masonry are the victims. "In a variety of more difficult applications, aluminum may replace any structural material," says the Metals Div. of Olin Mathieson Chemical Corp. "This is particularly true in inaccessible regions and rigorous climates."

It's not merely a question of substituting aluminum for other structural materials. As Kaiser puts it: "Aluminum is being used in many new design concepts where other materials would be unsatisfactory." Reynolds Metals Co. makes this point: "Our next step is the development of standard structurals especially designed for aluminum."

• **Who Makes Them**—Primary producers, with their large sheet mills and extrusion presses, fabricate about 95 per cent of the structurals. A few independents operate extrusion presses of sufficient size to compete with other medium-sized extruded structural sections. In general, integrated producers make the structurals, prime contractors do secondary fabrication.

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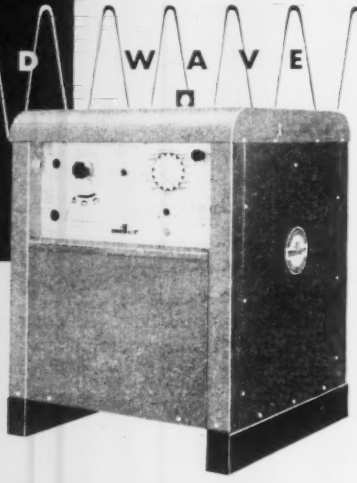
BALANCED WAVE
ELECTRIC CONTROL WELDER



Brings out BEST in TIG Welding

This new Miller development improves quality, speed and range of tungsten inert gas welding in all automatic fixture and manual applications. Balanced wave (BW) characteristic results from new Miller balance control which eliminates the d-c component present in most welding currents. Output of the Miller BW welder is ONLY pure a-c, DELIVERS:

Excellent arc stability
Maximum heat
Deeper penetration
Faster welding speeds

Complete particulars will be sent promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

Sheets, Strip . . .

Sheet & Strip Prices, Pages 190 & 191

Demand continues higher for sheets than any other major steel product. Volume is slipping seasonally as the holidays approach. Little change is reported in delivery promises on the principal grades, with hot rolled quoted around three to four weeks, and cold rolled five to six.

Deliveries on coated sheets extend through the first quarter of next year, except on conventional hot-dipped galvanized which run around eight weeks. Shipments of silicon sheets are a little easier than they were recently, reflecting, partly, a seasonal drop in small motor-driven appliances.

Midwestern mills report more forward ordering. Automotive and appliance requirements provide the biggest consuming outlets. The lack of push for fast deliveries indicates that manufacturing needs are cushioned to some extent by inventories.

Apparently, General Motors Corp. is the only automotive firm to commit itself to an inventory buildup in March and April. Ford still isn't definite, telling steelmen it's going to try to keep inventories low as long as possible. The steelmakers think Ford will fill its needs from its own mills if a steel strike is experienced in mid-1959. Ford steelworkers are members of the United Auto Workers, Local 600, not the United Steelworkers. Chrysler's plans are indefinite pending settlement of its labor problems with the UAW.

Appliance makers appear to be more eager to build steel inventories, but many are holding off to see what the auto companies do. Some warehouses and smaller converters say their larger customers are asking them to buy ahead from the mills and hold the stocks for their future use. That is being done in the case of hot-rolled sheets, in quantities not exceeding 300 to 400 tons.

A Pittsburgh sheetmaker is heavily booked up for first quarter, and anticipates a "terrific first half."

Wire . . .

Wire Prices, Pages 191 & 192

December shipments of manufacturers' wire will equal November's,

reports a Pittsburgh district producer.

"The upturn began at midyear," he said, "and every month since July has been better than the one preceding it. Automakers are chiefly responsible for the pickup, but they're not buying ahead. They're counting on delivery in three or four weeks. As a result, we're only one-third booked for January."

Fourth quarter shipments of another maker will exceed those in the corresponding 1957 period, even though foreign competitors have taken about 10 per cent of its east coast rod business.

Forward buying is slow, but orders for January are ahead of December's and are about back to the October-November level. Cold-heading grades and upholstering coils are slightly more active.

Deliveries, except for high carbon specialties, are not lengthening. Heavy stocks of finished wire hardware held by industrial supply distributors have been worked down.

Demand for wire fabric is seasonally slower. There are rumbles in the Detroit market concerning a price increase after Jan. 1, but some producers doubt the likelihood of such action.

Plates . . .

Plate Prices, Page 189

Tank and boiler shops are buying plates hand-to-mouth. Ship specifications are off slightly, but the development may be temporary since there are some signs of continued activity in shipbuilding. Last week, Bethlehem Steel Co. decided to keep ship repair facilities at its Staten Island (N.Y.) yard in operation past the end of the year.

Requirements from machine tool and heavy equipment builders are spotty, and railroad car needs, while up slightly, are still small.

Continued dull market conditions are reflected in easy deliveries. Buyers have no trouble getting sheared carbon plates in two weeks and less, silicon plates in three to four weeks, and alloy plates in four weeks.

Despite the generally dull market, a Pittsburgh mill reports its plate bookings are strong for December—easily the best of the year. Its January prospects are uncertain, but the outlook for the first half of 1959 is thought favorable. One buyer is placing orders as far ahead as June to assure prompt deliveries.

Some steel market observers figure the potential tonnage of steel plates for pipeline requirements in the near future at about 1 million

Tubular Goods . . .

Tubular Goods Prices, Page 193

"We've had a marked increase in oil country business the last ten days," reports a Pittsburgh tubemaker. "Standard pipe sales are steady, but conduit is in a seasonal decline. Combined shipments for December will be better than last month's. Some customers are ordering for first quarter delivery."

Another maker booked tonnage for first quarter delivery from one of the major oil drillers. He thinks first quarter, 1959, volume will better that in both the third and fourth quarters of 1958.

Some producers of line pipe and oil country goods anticipate a pickup in buying as a result of the Su-

STAINLESS COSTS LESS THAN ALUMINUM—

Do you know that the square-foot cost of stainless steel sheet for curtain wall panels is usually equal to or lower than aluminum when compared in thicknesses of equal indentation resistance? For example, Type 302 stainless steel, .022″ thick is equal to .051″ aluminum and costs only 62¢ per sq. ft., as compared to 67¢ per sq. ft. for 3003-H14 anodized aluminum.

For additional information on all gauges, fill in and mail the coupon.

Washington Steel Corporation
WASHINGTON, PENNSYLVANIA

MAIL COUPON *Today!*

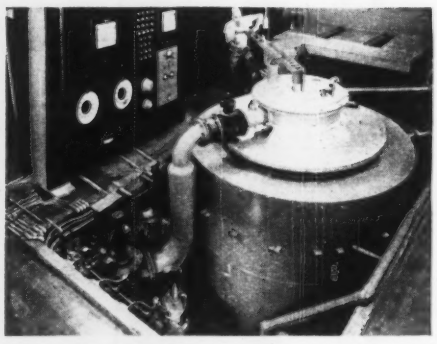
WASHINGTON STEEL CORPORATION
122-O Woodland Ave., Washington, Pa.

Gentlemen:
Please send me full information on comparative costs of stainless steel vs. aluminum for curtain wall panels.

Name
Position
Company
Street
City Zone State

YOU CAN FIND BOTH THE BIGGEST AND THE BEST AT YOUR COMMERCIAL HEAT TREATER

1



2

3

1 *A new gas fired Homocarb said to be the world's largest.*

2 *A Vacuum Heat Treating Furnace for special materials.*

3 *Large capacity vertical furnace for heat treating large parts.*

The three furnaces shown on this page are units of the facilities of commercial heat treating plants in three different sections of the country.

Today, with the ever growing demand for *better* heat treating, economical volume equipment of this sort is becoming essential and the commercial heat treater has been alert to industry's requirements.

Quality work and versatility are the keynotes of this industry's objectives when treating the thousands of vital, intricate, and costly components of important products.

Whatever your heat treating problem, and whether it involves pounds or tons, always consult your commercial plant first.

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

American Metal Treatment Co.
Elizabeth, New Jersey
Anderson Steel Treating Co.
Detroit, Michigan
Benedict-Miller, Inc.
Lyndhurst, New Jersey
Bennett Heat Treating Co., Inc.
Newark 3, New Jersey
Commercial Metal Treating, Inc.
Bridgeport, Conn.
Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio
Dominy Heat Treating Corp.
Dallas, Texas
Drever Company
Philadelphia 33, Pennsylvania
Greenman Steel Treating Company
Worcester 5, Massachusetts
Fred Heinzelman & Sons
New York 12, New York
Alfred Heller Heat Treating Co.
New York 38, New York
Hollywood Heat Treating Co.
Los Angeles 38, California
Ipsenlab of Rockford, Inc.
Rockford, Illinois
L-R Heat Treating Company
Newark, New Jersey
The Lakeside Steel Improvement Co.
Cleveland 14, Ohio
Metallurgical, Inc.
Minneapolis 14, Minnesota
Metallurgical, Inc.
Kansas City 8, Missouri
New England Metallurgical Corp.
South Boston 27, Massachusetts
Owago Heat Treat, Inc.
Apalachin, New York
Paulo Products Company
St. Louis 10, Missouri
Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania
Pittsburgh Metal Processing Co., Inc.
Pittsburgh 15, Pennsylvania
The Queen City Steel Treating Co.
Cincinnati 25, Ohio
J. W. Rex Company
Lansdale, Pennsylvania
Stanley P. Rockwell Company
Hartford 12, Connecticut
Scott & Son, Inc.
Rock Island, Illinois
Syracuse Heat Treating Corp.
Syracuse, New York
Temperature Processing Co.
North Arlington, New Jersey
CANADA
Ipsenlab of Canada Ltd.
Toronto, Ontario

preme Court's reversal of the lower court's ruling in the Memphis gas rate case. (See Page 85 for details.)

Mechanical tubing sales are rising. Automotive demand is chiefly responsible. Shipments to machinery and industrial equipment makers are also improved, and farm implement manufacturers have stepped up their buying. Warehouses are ordering on a month-to-month basis.

Pressure tubing sales are being maintained at a fair level. Boiler manufacturers are providing support, offsetting weakness in other market areas.

Producers of cast iron pipe report seasonal dullness, but they anticipate renewed buying interest as soon as municipalities enter the market for their spring needs.

Within 90 days, Lone Star Steel Co., Lone Star, Tex., will be producing black pipe for general use. The expansion of the product mix is being made with only minor changes in equipment, reports E. B. Germany, president.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 189

Stone & Webster Engineering Corp., Boston, is placing 100 tons of reinforcing steel around the base of a structure which will house the nuclear reactor of the Yankee Atomic Electric Co. powerplant, Rowe, Mass.

The structure, which will be enclosed in a steel sphere having a diameter of 125 ft, will require 600 tons of steel and 12,000 tons of concrete.

Steel Bars . . .

Bar Prices, Page 189

Pressure on bar mills for deliveries has let up slightly, but automotive requirements are still increasing, particularly for components. Partmakers are ordering hot and cold rolled carbon bars, and also hot and cold rolled alloy tonnage.

A barmaker in the Detroit area reports he's fully booked up for December and his order book for January is half filled. Most of his shipments are to automakers who are carrying about a 26-28 day bar inventory.

Demand for stainless steel bars

With industry everywhere

the No. 1 choice is the V-belt with concave sides

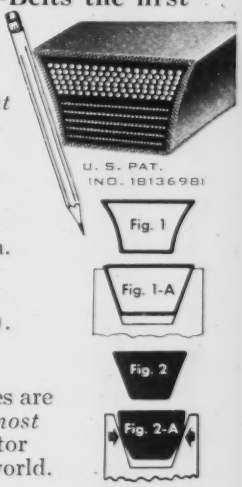
It is easy to see why concave sides insure far longer belt life... and make Gates V-Belts the first choice of industry everywhere.

Just *make this simple test:* bend a Gates V-Belt as if it were going around a sheave. Feel how the concave sides (Fig. 1) *fill out* ... become perfectly straight (Fig. 1-A).

Note how this belt thus makes full contact with the sides of a sheave ... grips the sheave evenly, distributing wear uniformly across the sides of the belt. Uniform wear lengthens belt life — keeps costs down.

With a straight-sided belt (Fig. 2) the sides *bulge out* when the belt is bent, and wear is concentrated on the bulge (Fig. 2-A). Uneven wear shortens belt life — increases belt costs.

Because Gates V-Belts with concave sides are so universally preferred, they are also the *most widely available.* There are Gates Distributor stocks in industrial centers throughout the world.



The Gates Rubber Company, Denver, Colorado

Gates *World's Largest Maker of V-Belts* TPA 351

Gates VULCO ROPE Drives

is unchanged from that a month ago.

Deliveries on hot rolled carbon bars now range two to four weeks, depending on rolling cycles.

Imported Steel Sales Increase in Southwest

Imported steel volume is cutting down domestic sales in the Southwest. In addition to dominating sales of reinforcing bars, importers are making inroads in the market for merchant bars, structurals, and rods.

Wire products were written off to the importers long ago. Recently, Japanese plates have been offered in Houston at prices ranging $8 to $9 under domestic mill quotations.

Pig Iron . . .

Pig Iron Prices, Page 194

Business in merchant pig iron continues to coast, with the downtrend expected to extend into the new year. Demand is well below furnace capacity. Foundries are operating on low stocks, largely because of their light order backlogs. That explains the frequent calls on suppliers for rush carloads.

With the holidays approaching, no upswing in business is anticipated until next quarter. Here and there, though, some encouraging signs can be seen in the market picture. For example, Symington-Gould Div., Symington-Wayne Corp., operating a large foundry in Depew, N. Y., reports improved demand for railroad castings. Foundries making automotive castings are also doing better than they were.

Youngstown Sheet & Tube Co., Youngstown, will light its Jeannette blast furnace, one of two units at its Brier Hill Works. It is an 800-ton furnace, idle since last January.

At the same time Sherango Furnace Co., Sharpsville, Pa., is recalling an additional 100 employees at its ingot mold division.

Iron Ore . . .

Iron Ore Prices, Page 195

Vessel shipments of Lake Superior iron ore in November totaled 4,528,563 gross tons, reports the American Iron Ore Association. In November, 1957, the movement amounted to 4,066,829 tons.

Shipments to the end of November amounted to 52,792,715 tons, off 31,803,658 from the 84,596,373 tons moved in the like period of the 1957 shipping season.

Except for the ports of Escanaba and Michipicoten, figures are final for the season. The 1958 season movement is the smallest since 1939 when the total was 45,547,974 tons.

August imports of iron ore for consumption in the U. S. totaled 2,854,056 gross tons valued at $24,491,792, reports the Bureau of Mines. Canada supplied 47 per cent, Venezuela 37 per cent, Chile 9 per cent, Peru 3 per cent, Brazil 2 per cent, and Liberia, Mexico, Philippines, and the United Kingdom 2 per cent.

In the first eight months of this year, imports valued at $148,084,679 amounted to 17,451,482 gross tons, 18 per cent less than in the like 1957 period. They accounted for about 25 per cent of total domestic supply in the period.

Iron Ore Imports*
(Gross tons)

Sources	August, 1958	First Eight Months 1958
Brazil	43,460	500,380
British W. Africa	.....	29,280
Canada	1,339,013	4,667,669
Chile	264,407	2,177,016
Denmark	.....	98
Dominican Republic	.....	21,000
Iran	.....	2,461
Liberia	31,539	514,581
Mexico	11,272	146,138
Panama	.....	13,856
Peru	98,324	1,254,950
Philippines	9,800	53,851
Sweden	.....	93,984
United Kingdom	129	544
Venezuela	1,056,112	8,065,674
Total	2,854,056	17,541,482

*Exclusive of ore containing 10 per cent or more manganese.

Structural Shapes . . .

Structural Shape Prices, Page 189

Competition among structural fabricators is stronger. Many shops are reaching out for work they normally wouldn't consider (for reasons of size, type of structure, and geographic location). Significantly, 13 fabricators recently bid directly on 1400 tons of Pennsylvania State bridgework in Susquehanna County. Eleven general contractors also bid.

Some of the larger and medium-sized fabricators say their backlogs are still holding up well. Most shops anticipate an upturn in demand in February.

New England shops have small backlogs; sharp competition is reflected in easing prices. Bridges account for the bulk of volume in the area. Most are of stringer and rolled beam design, requiring a minimum of shopwork.

With plain material available from the mills in about four weeks (less in some cases), fabricating shops are ordering only to fill requirements in sight.

Heavy bridge volume is projected for the San Francisco area. A proposal for a twin span alongside the San Mateo-Hayward Bridge will be introduced in the California legislature in January. The project would cost about $25 million. Also considered in long range planning is a larger bridge closer to San Francisco to complement the San Francisco-Oakland Bay span.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1100 tons, foundation work, office building, Western Electric Co., Broadway and Fulton St., New York, to Dreier Structural Steel Co. Inc., Long Island City, N. Y.; this is in addition to 5500 tons recently reported placed with this same fabricator for the main structure.

400 tons, state bridgework, Fulton County, Pennsylvania, prestressed concrete design, J. Robert Bazley, Pottsville, Pa., general contractor, one of 15 bidders.

700 tons, maintenance hangar, Scandinavian Air Lines, Idlewild Airport, Long Island, N. Y., to the White Plains Iron Works, Peekskill, N. Y.

645 tons, hangar, Logan Air Field, Boston, to A. O. Wilson Structural Co., Cambridge, Mass.; bids direct on steel.

437 tons, Entiat Bridge, Rocky Reach reclamation project, for Chelan County P.U.D. No. 1, Wenatchee, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Snitily Bros. Construction Co., Wenatchee, low at $506,316.

400 tons, additions to Port of Tacoma grain elevator, to Isaacson Iron Works, Seattle, bidding $119,742.

250 tons, state highway bridge, Concord, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Maine; R. G. Watkins, Amesbury, Mass., general contractor.

245 tons, St. Vincent's Orphanage, Philadelphia, to Joyce Steel Fabricators, Chester, Pa.

215 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Southern Galvanizing Co., Baltimore.

200 tons, plant building, Bird & Son Inc., Norwood, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; Vappi Construction Co., Boston, general contractor.

200 tons, five-span stringer bridge, Rehoboth, Mass., to City Iron Works, Wethersfield, Conn.; M. A. Gammino Construction Co., Providence, R. I., general contractor.

175 tons, WF 60-ft lengths, Navy Purchasing Office, Los Angeles, to Columbia-Geneva Steel Div., U. S. Steel Corp., Los Angeles.

135 tons, Dimmitt School, Renton, Wash., to Leckenby Structural Steel Co., Seattle.

120 tons, Bureau of Public Roads, Eagle Cliff, Oreg. bridge, to Oregon Iron Works, Portland, Oreg.

125 tons, two-span composite WF beam bridge, Bethel, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; Ralph B. Goodrich Inc., South Burlington, Vt., general contractor; reinforcing bars, Truscon Steel Div., Republic Steel Corp., Boston.

110 tons, storage tanks for Fisher Flouring Mills Co., Seattle, and grain storage for Port of Walla Walla, Wash., at Pasco, Wash.

STRUCTURAL STEEL PENDING

8200 tons, state roadwork, Westchester County, New York, Poirier & McLane Corp. low on the general contract.

1440 tons, office building, U. S. Commission to the United Nations, New York, Sovereign Contracting Co., Ft. Lee, N. J., general contractor.

1400 tons, state bridgework, Susquehanna County, Pennsylvania, Lycoming Construction Co., Williamsport, Pa., low on the general contract.

1300 tons, Fresh Pond bus garage, New York City Transit Authority, for erection in the Borough of Queens, bids closed.

876 tons, state bridgework, LR 641/22-A, Beaver County, Pennsylvania, bids to be taken Dec. 30.

850 tons, state highway bridges Stoneham-Winchester-Woburn, Mass.; bids in.

584 tons, wharf on lower Manhattan for the New York City Marine & Aviation Department; bids closed.

587 tons, state bridgework, Broome County, New York; Harris & Burrows, Jersey City, N. J., awarded the general contract.

560 tons, state bridge, LR 799/1, Franklin County, Pennsylvania, bids to be taken Dec. 30.

870 tons, approach to Washington State Hood Canal bridge; bids to Olympia, Wash., postpoed to Dec. 16.

295 tons, research center, University of Washington; W. G. Clark Construction Co., Seattle, low at $389,783.

250 tons, state highway bridge, Andover, Mass.; bids in.

105 tons, state highway bridge, Vernon, Conn.; bids Dec. 15, Hartford, Conn.

REINFORCING BARS . . .

REINFORCING BARS PLACED

800 tons, Overlake Catholic School, Issaquah, Wash., to Northwest Steel Rolling Mills Inc., Seattle; J. C. Boespflug Construction Co., Seattle, general contractor, low at $3,395,847.

313 tons, relocation bridges for P.U.D. No. 1, Wenatchee, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Snitily Bros., Wenatchee, has general contract at $506,316.

310 tons, Newcombe Hospital, Vineland, N. J.; to unnamed supplier.

REINFORCING BARS PENDING

2300 tons, Hawthorne Apartments, Philadelphia; pending.

665 tons, state bridgework, Armstrong County, Pennsylvania, bids Dec. 19; also requires 1560 tons of structural steel.

535 tons, state bridgework, Cumberland County, Pennsylvania, bids Dec. 19; project also requires 1947 tons of structural steel.

525 tons, Hanson Dam project near Seattle, also 160 tons of shapes and plates involved; general contract to Henry J. Kaiser-Raymond Inc., Oakland, Calif., low at $8,840,000 to the U. S. Engineer, Seattle.

350 tons, Idaho State highway project, Cassia County, seven bridges and passes; Lonnie E. Smith Construction Co., Twin Falls, Idaho, low at $520,082.

266 tons, state bridgework, Lackawanna County, Pennsylvania; bids Dec. 19.

255 tons, also 180 tons of shapes, Washington State, King County bridge and approaches; general contract to Neukirch Bros. and Puget Sound Construction Co., Seattle, joint low bidders at $370,035.

150 tons, addition to Lincoln High School, Seattle; general contract to Lease Co., Seattle.

PLATES . . .

PLATES PLACED

255 tons, hull, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (American), New York.

100 tons, grade Hy-80, Navy Purchasing Office, Washington, to U. S. Steel Corp., Pittsburgh.

60 tons or more, water storage tank, Overlake Catholic School, near Seattle, to the Chicago Bridge & Iron Co., Seattle.

PLATES PENDING

475 tons, grade Hy-80, Navy Purchasing Office, Washington, bids to be taken Dec 17.

155 tons, class B, grade 2, Watertown Arsenal, Watertown, Mass.

RAILS, CARS . . .

RAILROAD CARS PLACED

New York Transit Authority, 110 subway cars, to American Car & Foundry Div., ACF Industries, New York; 200 additional cars to be purchased in 1959, subject to approval by the New York City Board of Estimate.

Union Pacific, five coaches, to St. Louis Car Co., St. Louis.

Northern Pacific, 400 forty-ft boxcars and 100 fifty-ft insulated boxcars, to its Brainard, Minn., shops; railroad contemplates purchasing 50 mechanical refrigerator cars from an outside carbuilder.

Distributors . . .

Prices, Page 194

Steel service centers report demand is slowing down as the holiday season nears, though the experience of all sellers is not alike in all districts. In the East, indications are that October and November were the two leading months of the year, valuewise because of higher prices, and tonnagewise because of stronger demand.

In the Southwest, sales are reported picking up. One distributor thinks December volume will match that in October. Fair weather is reflected in continued steady movement of building steel products.

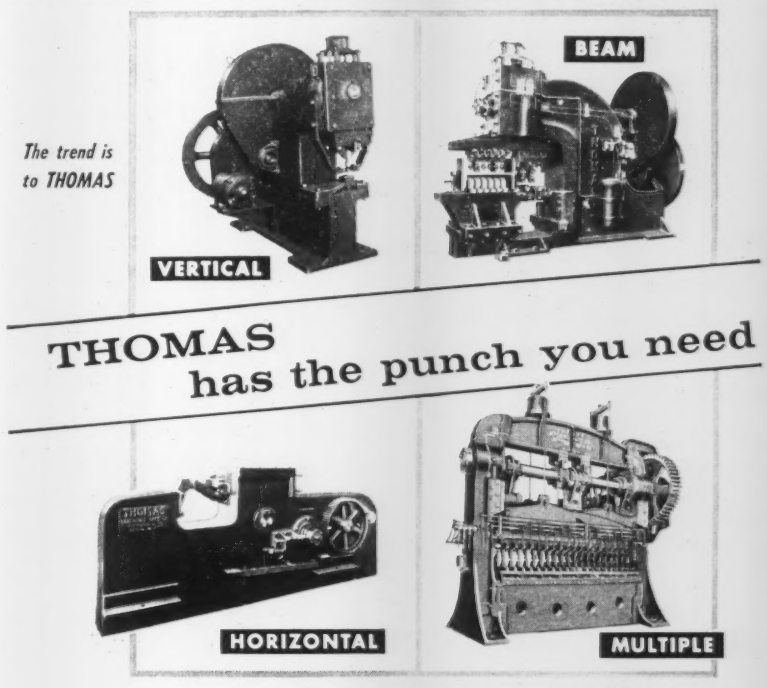
Prices were raised in the Pacific Northwest last week, the new schedule conforming with mill advances effected last summer. Area sellers report business is slightly improved. In the Los Angeles market, volume is reported up 15 per cent over October levels.

Business has been as level as a billiard table in the Chicago market since early October.

Steel shipments by the service centers this year will be down 25 to 30 per cent from 1957's. It's believed 1959 business will make up the 1958 losses. A gain of about 15 per cent is looked for.

Currently, business is best on the West Coast. Chicago also is another strong area. Weakest area seems to be Cleveland, with the East Coast not far behind.

Most current demand is for flat-rolled products, but the movement of other products is fairly uniform, except that structurals are on the light side. Price cutting continues, particularly on the West Coast and in Texas.



November Zinc Shipments Second Best Since May, '57

Shipments of slab zinc fell a little in November, but it was the second best showing the metal has made since May, 1957—last month was better.

Total shipments, including export and drawback, hit 83,606 tons, compared with October's 93,244 tons.

Stocks tumbled for the fourth straight month and now stand at 191,744 tons. Stocks hit their high in July when they registered 257,911 tons.

Producers expect high level galvanizing operations and improved demand for diecastings to make December as good a month as November for the zinc industry.

Harvester Labor Trouble Forces More Layoffs

The Milwaukee Works of International Harvester Co. laid off 1150 production and maintenance workers on Dec. 5. The move was made necessary by United Auto Worker strikes at other Harvester plants. Harvester's Milwaukee workers were not on strike.

The union and company met with federal negotiators last week in an effort to end the strike which started Nov. 13 and has idled 36,000 workers. The company made a new proposal for a three-year contract which provides annual pay boosts retroactive to Aug. 23.

A 75-day strike at Kensington Steel Co., Chicago, a steel foundry, ended when an agreement between the company and its UAW union was reached Dec. 5. Terms provided an 8 cent an hour pay increase for production workers, 16 cents for skilled workers, a 45 cent raise for incentive workers (who will get the 8 cent increase when not on piecework), and a 5 cent raise for maintenance helpers.

The strike involved 260 workers.

November Steel Output Tops Year Ago Mark

November steel ingot production amounted to 8,582,000 tons, or 74.2 per cent of capacity, reports the American Iron & Steel Institute. It compares with a revised figure for October of 8,817,778 tons, or 73.8 per cent of capacity.

The total output for the first 11 months of the year was 76,469,045 tons, vs. 105,294,711 in the like period a year ago.

November was the first time this year that output exceeded a year-ago period. Output in November, 1957, was 8,392,919 net tons.

Canada . . .

Canadian steel production has returned to normal following the strike settlement and resumption of operations at the Steel Co. of Canada Ltd.

For the week ended Dec. 1, production of steel ingots rose to 98,989 tons, or 87.1 per cent of rated capacity. That compares with 98,066 tons, or 86.2 per cent in the preceding week, and 95,164 tons, or 83.7 per cent of capacity in the week ended Nov. 15.

October Steel Shipments Largest Since Year Ago

Finished steel shipments during October totaled 6,224,540 net tons, reports the American Iron & Steel Institute. That's nearly 16 per cent more than the September figure and is the largest monthly tonnage shipped sice October, 1957. September shipments were 5,386,292 net tons, and in October, 1957, the total was 6,550,690 tons.

In the first ten months this year shipments amounted to 49,226,073 tons. That's down sharply from the 69,155,531 moved in the corresponding period of 1957.

For the first time this year, monthly shipments of cold-rolled sheets exceeded a million tons (1,074,165 tons) in October. Other major product shipments included: Electrolytic tin plate (763,361 tons); hot-rolled sheets (687,273 tons); hot-rolled bars, including light shapes (593,804 tons); plates (460,986 tons).

Shipments to major markets were: Warehouses and distributors, 1,113,944 tons; automotive, 1,056,706; containers, 936,668; construction, including maintenance, 781,392; contractors' products, 333,598 tons.

Stainless Steel . . .

Stainless Steel Prices, Page 193

Demand for stainless steel bars shows little change from that a month ago, reports a Detroit area seller. Flat-rolled stainless orders, however, are increasing.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

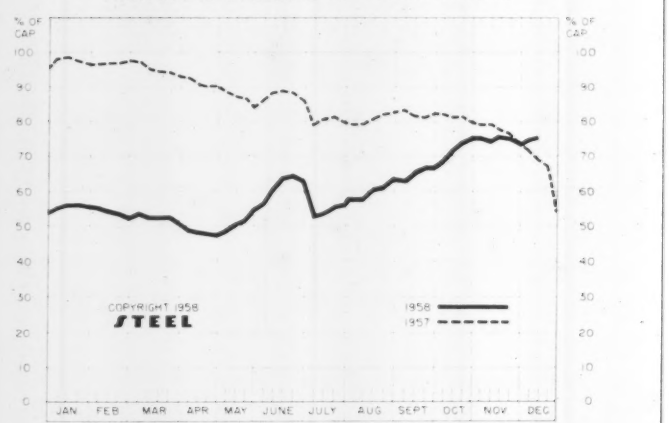
	Week Ended Dec. 14	Change	Same Week 1957	Same Week 1956
Pittsburgh	72	+ 5*	67	102.5
Chicago	85.5	+ 0.5*	75	101
Eastern	71	0	81	102
Youngstown	60	0	65	104
Wheeling	83.5	+ 0.5	61.5	100
Cleveland	73.5	+ 3.5*	68	104.5
Buffalo	68.5	+ 2.5	63.5	107.5
Birmingham	65	+ 2.5	67	94
Cincinnati	86	+ 4.5	72.5	93.5
St. Louis	94	+ 6*	60.5	95.5
Detroit	97	— 3	91.5	103.5
Western	79	— 1	80	103
National Rate	75.5	+ 1	69	102

INGOT PRODUCTION‡

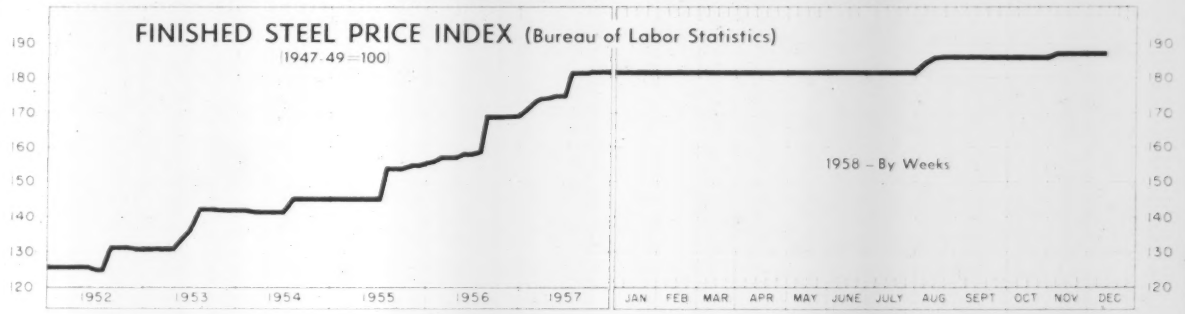
	Week Ended Dec. 14	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	125.4	123.6	125.2	110.2
NET TONS (In thousands)	2,015	1,985	2,011	1,770

*Change from preceding week's revised rate. ‡Estimated. †American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Dec. 9, 1958	Week Ago	Month Ago	Nov. Avg	Year Ago
187.4	187.4	186.7	187.4	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 9

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.525
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.553
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.695
Sheets, C.R., Stainless, 302 (lb)	0.688
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.493
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	20.525
Pipe, Galv., Buttweld (100 ft)	24.315
Pipe, Line (100 ft)	205.710
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	26.157
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.653
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.828
Wire, Barbed (80-rod spool)	8.719
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 10 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$146.03	$114.64
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	58.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	58.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	39.17	39.67	42.33	32.00	33.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 10 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 5/32-5/8" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	Dec. 10 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$41.50	$41.50	$44.50	$31.50	$33.50
No. 1 Heavy Melt, E. Pa.	34.00	35.00	40.00	33.50	33.00
No. 1 Heavy Melt, Chicago	42.00	42.50	42.50	31.00	32.50
No. 1 Heavy Melt, Valley	42.50	42.50	43.50	29.50	32.50
No. 1 Heavy Melt, Cleve.	39.00	39.00	40.00	26.50	30.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	35.50	31.50	32.50
Rails, Rerolling, Chicago	63.50	63.50	62.00	47.50	46.50
No. 1 Cast, Chicago	45.50	45.50	45.50	35.50	33.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

We took a sage suggestion from Santa

"This Christmas check is wonderful," our office Santa Claus told us last year while he was making up for the office party. "But you should have enclosed an application card for more U.S. Savings Bonds on our Payroll Savings Plan. The time to persuade me to *invest* money is when I *have* money."

That was such a sound idea that this year all our Christmas checks to employees will be accompanied by a Payroll Savings card and the suggestion that the recipient sign up immediately for the regular purchase of U.S. Savings Bonds through the coming year.

Experience shows that whenever a company makes it easy for employees to set up sound savings plans, people welcome this opportunity. Today there are more payroll savers than ever before in peace time. For helpful suggestions and the newest information folders and leaflets, call your State Savings Bonds Director. You'll find him listed in the phone book. Or write: Savings Bonds Division, U.S. Treasury Dept., Washington, D. C.

STEEL
The Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE

Steel Prices

Mill prics as reportd to STEEL, Dec. 10, cents per pound except as otherwise noted. Changes show in italics. Code number following mill points indicates producing company. Key to producers, page 190, footnotes, page 192.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....80.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B3 ....80.00
Lackawanna,N.Y. B2, 80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ....80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3 ....104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ....99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....113.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14 ....99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$119.00
Bridgeport,Conn. C32 ....119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3 ....126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ....119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2 ....119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14 ....119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ....122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
N. Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14 ..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ....5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14 ..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.15
IndianaHarbor,Ind. I-2 ..5.50
Lackawanna,N.Y. B2 ....5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14 ..6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ....8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14 ..8.05
S.SanFrancisco B3 ....8.70
Struthers,O. Y1 ....8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ....8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ....5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ....6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ....5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ....6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ....5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14 ..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.50
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ....7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ....7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ....8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.55
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14 ..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, ALLOY
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L17 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14 ..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa, Pa.(9) J5 ..5.675
Alton,Ill. L1 ....5.775
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ....5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ....6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 ....5.675
KansasCity,Mo.(9) S5 ..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ....6.15
Midland,Pa.(23) C18 ....6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
N.Tonawanda,N.Y.(23) B11 6.025
Owensboro,Ky.(9) G8 ....6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ....5.675
Seattle B3, N14 ....6.425
S.Ch'e'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 ..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15 ..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ....5.675
Torrance,Calif.(9) C11 ..6.375
Warren,O. C17 ....6.025
Youngstown(9) R2, U5 ..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ....6.90
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ....6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ....8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14 ..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ....5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ....5.675
Tonawanda,N.Y. B12 ....5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa, Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S6 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ....8.25
Buffalo R5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind.J5, L2 ....7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ....7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putman,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
WillimanticConn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
CumberlandMd. (5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ....9.175
Buffalo R5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ....9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2 ....9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 ....9.025
Lackawanna,N.Y. B2 ....9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025
Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ....9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex.(4)(26)T4 6.125
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ....6.10
Torrance,Calif. C11 ....6.375
Youngstown R2, U5 ....5.675

BARS, Reinforcing, Billet (Fabricated; to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ...7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ....7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4)(44) I-2 5.675
ChicagoHts.(4) C2 .....5.675
Franklin,Pa.(3) F5 .....5.575
Franklin,Pa.(4) F5 .....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 .....5.575
Tonawanda(3) B12 .....5.575
Tonawanda(4) B12 .....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ...5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 .....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ...5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ...5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ...5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ...5.10
Steubenville,O. W10 .....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5, Y1 .....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 .....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 .....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa, Pa. J5 ....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ...7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 .7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ....7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 .7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2, ..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 .....7.525
Youngstown U5, Y1 ...7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky.(8) A10 ....5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ...6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ...6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ...6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ...6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ...6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 .....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 .....6.275
SparrowsPoint,Md. B2, ..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 .....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 .9.275
Irvin,Pa. U5 .....9.275
Lackawanna(37) B2 ....9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2, ..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 .....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt.,Md. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 .....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind., C16 .....6.975‡
MartinsFerry,O. W10 ...6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ...6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 .....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
SparrowsPt.(39) B2 ..10.025
Pittsburgh J5 .....10.125

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Youngstown J5 .....7.50
Weirton,W.Va. W6 ....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2,Y1 .6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 .....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 .....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 .....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simmons Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am.Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackawanna,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover, O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
New York W3	...	...	18.85	22.95	27.80
Palmer,Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown S41	...	...	19.20	23.30	28.15

Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)

Aliquippa,Pa. J5	7.90	8.10	...
Niles,O. R2	7.90	8.10	8.30

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Struthers,O. Y1	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

(Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875	11.70*	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875	11.70	12.40	13.55	14.65
Warren,O. R2	9.875	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A11	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint, Md. B2	8.10
Sterling,Ill.(4) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Millbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE

	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.55
Crawfordsville,Ind. MS	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.55
Franklin Park,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.55
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
Alabama City,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. MS	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
Kansas City,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
Sparrows Pt.,Md. B2	173
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)
To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
Alabama City,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. MS	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. MS	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
Kansas City,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)
Coil No. 3150

Alabama City,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. MS	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. MS	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
Kansas City,Mo. S5	10.51
Kokomo,Ind. C16	10.36
Los Angeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.San Francisco C10	11.04
Sparrows Pt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

Alabama City,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. MS	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. MS	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
Kansas City,Mo. S5	10.85
Kokomo,Ind. C16	10.70
Los Angeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.30
S.Chicago,Ill. R2	10.60
S.San Francisco C10	11.40
Sparrows Pt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

Alabama City,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. MS	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. MS	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
Kansas City,Mo. S5	10.90
Kokomo,Ind. C16	10.75
Los Angeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.San Francisco C10	11.45
Sparrows Pt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
Alabama City,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	214
Joliet,Ill. A7	212
Kansas City,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.San Francisco C10	236
Sparrows Pt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
Chicago Hts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F3	177
Johnstown,Pa. B2	177
Morrison,Ill. F11	177
Minnequa,Colo. C10	182
Sterling,Ill. (7) N15	177
Tonawanda,N.Y. B12	172

WIRE, Barbed

	Col.
Alabama City,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198§
Crawfordsville,Ind. MS	198§
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. MS	198§
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
Kansas City,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.San Francisco C10	213*
Sparrows Point,Md. B2	195§
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192†
Crawfordsville,Ind. MS	192†
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. MS	192†
Johnstown,Pa. (43) B2	190§
Joliet,Ill. A7	187†
Kansas City,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill. (7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville,Ill. K4	17.95	19.75
Cleveland A7	17.85	....
Craw'dsville,Ind. MS	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville,Ill. MS	17.95	19.80††
Johnstown,Pa. B2	17.85	19.65‡‡
Kan.City,Mo. S5	18.10	....
Kokomo,Ind. C16	17.25	18.80†
Minnequa,Colo. C10	18.10	19.65**
Pitts'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.San Fran.,Calif. C10	18.20	19.75**
Sterling,Ill. (37) N15	17.25	19.65††
Sparrows Pt.,Md. B2	17.95	19.75§
Waukegan,Ill. A7	17.85	19.40†
Worcester,Mass. A7	18.15	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa,Pa. J5	8.65	9.325§
Atlanta,Ga.(48) A11	9.10	9.775§
Bartonville,Ill.(48) K4	9.10	9.775
Buffalo,N.Y. W12	9.00	9.55†
Cleveland,O. A7	9.00	....
Crawfordsville,Ind. MS	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth,Minn. A7	9.00	9.55†
Fairfield,Ala. T2	9.00	9.55†
Houston,Tex.(48) S5	9.25	9.80**
Jack'ville,Fla. MS	9.10	9.80††
Johnstown,Pa.(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City,Mo.(48) S5	9.25	9.80**
Kokomo,Ind.(48) C16	9.10	9.65†
Los Angeles,Calif. B3	9.95	10.625§
Monessen,Pa.(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago,Ill. R2	9.00	9.55**
S.San Fran.,Calif. C10	9.95	10.50**
Spar'wsPt.,Md.(48) B2	9.10	9.775§
Sterling,Ill.(48) N15	9.25	9.925††
Stirling,Ill.(48) N15	9.15	9.825††
Struthers,O. Y1	9.00	9.65†
Worcester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50, 15c, $10c, ‡Less than 10c, †10.50c, ††11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅝ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

½ in. diam.	50.0
⅝ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1¼ and 1¾ in. diam.	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:	
All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:	
¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):	
⅝ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5
Hex Nuts, Finished (Incl. Slotted and Castellated):	
⅝ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):	
⅝ in. and smaller	62.0
⅞ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:	
6 in. and shorter:	
⅝ in. and smaller	35.0
¾ in. ⅞ in. and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾ in. ⅞ in. and 1 in.	+11.0
High Carbon, Heat Treated:	
6 in. and shorter:	
⅝ in. and smaller	20.0
¾ in. ⅞ in. and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾ in. ⅞ in. and 1 in.	+39.0
Flat Head Cap Screws:	
¼ in. and smaller, 6 in. and shorter	+85.0
Setscrews, Square Head, Cup Point, Coarse Thread:	
Through 1 in. diam.:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+25.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in. or larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15.0%.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$32.15	$48.20	$61.55	$81.10	$105.65
Buffalo W12	32.15	48.20	61.55	81.10	105.65
Cleveland A7	32.15	48.20	61.55	81.10	.....
Kansas City,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P14	32.15	48.20	61.55	81.10	105.65
New Haven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	.....	48.20	61.55	81.10	.....
Pueblo,Colo. W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.20	105.65
*St.Louis LS	*28.95	*43.40	*54.40	*74.00	*95.10
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	All	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	.....	.....	....	6.725
Gary,Ind. U5	5.75	5.65	....	.....
Huntington W.Va. C15	.....	.....	....	6.50
Johnstown,Pa. B2	.....	.....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.22
Steelton,Pa. B2	5.75	5.65	....	.....
Williamsport,Pa. S13	.....	.....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
Kansas City,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
Kansas City,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 6.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.635" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9.1½ Ga.
(44) To fabricators.
(48) 6.7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	10.5	+36	21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	10.75	+28	7.75	+24	4.25	+19.5	1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	48.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., Washington Steel Corp.

Clad Steel

	Plates— 5%	Carbon Base 10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	34.75	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides),				
Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld	....	67.60	67.60	68.13
Lawrenceville,Homestead,				
Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo, H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.99
Boston	9.31	10.40	11.39	53.50	9.73	10.11	13.39 #	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.64	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	11.10	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.88	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.55	12.50	57.38	10.55	10.65	14.70	16.80	9.80	9.70	12.10
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡ ¾ in. to 4 in. wide, inclusive; # net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Farrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	*$12.25-$12.50**
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$12.00-14.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens:	
New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	31.00‡
Toluene, one deg. (deld.)	25.00*
Industrial xylene	29.00‡

Per ton, bulk, ovens

Ammonium sulfate	$32.00-35.00†

Cents per pound, producing point

Phenol**: Grade 1, 15.50; Grade 2-3, 15.00; Grade 4, 17.00; Grade 5, 16.50; Grade 6, 14.25.

Effective: *Apr. 12; †July 1; ‡July 8; Aug. 12; **Nov. 4.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River	9.50
Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.87% Fe, irregular fragments of ⅜ in. x 1.3 in.	28.75
(In contract lots of 210 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9% 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	

Aluminum: Atomized, 500-lb drum, freight allowed: Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.00-48.90†
Bronze, 5000-lb lots	49.60-53.70†
Copper: Electrolytic	1⅞ 25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.99-55.40†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡

Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8		60	14.25
10		60	13.80
12		60	14.75
14		60	14.75
14		72	12.55
17		60	12.65
17		72	12.10
20		90	11.55
24	72, 84		11.95
24		96	12.10
30		84	12.00
35, 40		110	11.60
40		100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.10	$5.10	$5.00	$5.45
Bar Size Angles	5.00	5.00	4.90	5.33
Structural Angles	5.00	5.00	4.90	5.33
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.15	5.28	5.10	5.45
Wire Rods O.H. Cold Heading Quality No. 5	6.05	6.18	6.00	6.30
Bright Common Wire Nails ($)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. $Per 100-lb kegs, 20d nails and heavier.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade, (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ½" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb of contained Si. Packed c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (19-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

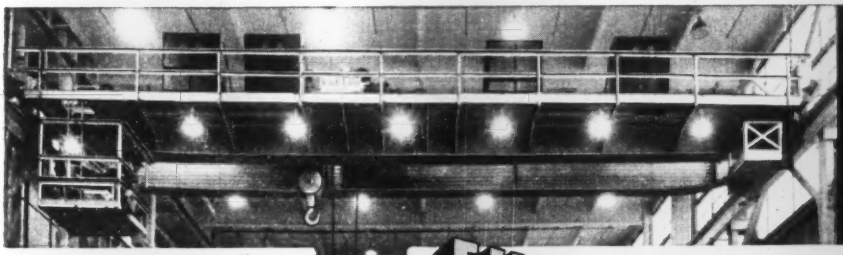
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Deliveried.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



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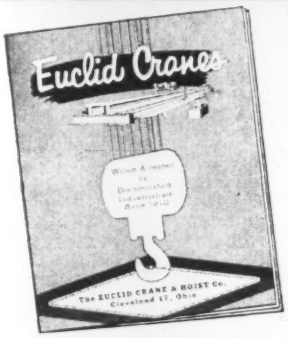

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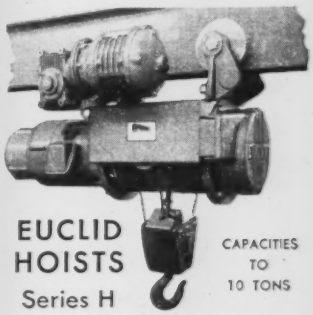

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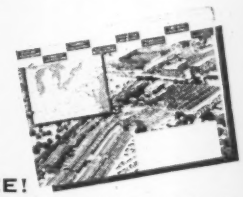

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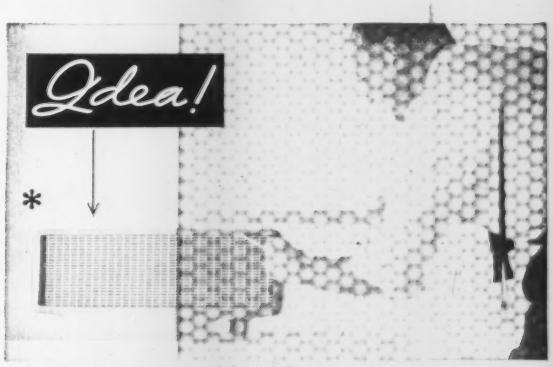

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Scrap Index Drops Another 50 Cents

STEEL's composite on the prime grade now stands at $39.17, and the market is still pointing downward. Lagging consumer interest is intensified by approaching holidays

Scrap Prices, Page 200

Pittsburgh — Prices continue to slip as mills refrain from buying. Brokers report No. 2 bundles are being offered from outside the district at $26, delivered. They're going begging. Railroad lists are off sharply. The B&O offered No. 1 heavy melting at $44.15, about $2.60 less than it got last month. Wheels went for $47.25, vs. $51.25 a month ago.

Chicago—Several leading grades of steelmaking scrap are off $1 a ton on new purchases by a district mill. Grades involved: No. 1 industrial heavy melting, No. 2 heavy melting, No. 1 factory bundles, No. 1 railroad heavy melting, and turnings and borings.

The tonnage moving is small, but it is sufficient to make for a general agreement on the market price level.

Steelmaking operations in the district are holding at 85.5 per cent of capacity, and indications are this pace will be maintained over the rest of the year.

Philadelphia — Prices continue easy, with domestic demand spotty and export business at a standstill. Short shoveling turnings are lower at $21-$22, machine shop turnings at $18-$19, and heavy turnings at $30. Mixed borings and turnings are off nominally to $19, and rail crops (2 ft and under) are lower at $55-$57 on light sales. The cast iron grades are stronger than the steel grades. Malleable is higher at $59-$60.

No. 1 heavy melting steel and No. 1 busheling are off $1 a ton to $34, delivered, and No. 1 bundles similarly to $35. No. 2 heavy melting is also down $1 to $31, and No. 2 bundles are off 50 cents to $22.

New York — Brokers' buying prices are easier, with a reduction in No. 2 bundles to $17-$18. All other grades are unchanged. Consumption continues light.

Cleveland—Not much activity is anticipated in the scrap market the rest of the year. Steelmakers' inventories are substantial, and increased use of blast furnace hot metal is holding down scrap needs. The market is pointing downward, but in the absence of a buying test, prices are unchanged and nominal.

Detroit — Purchases by Great Lakes Steel and for the Canadian market last week moved area scrap prices upward. Some 15,000 to 20,000 tons were reportedly involved in the Great Lakes transaction.

Dealers and brokers think the increase stems from local speculative conditions. The basic demand for scrap is still light, and prices are

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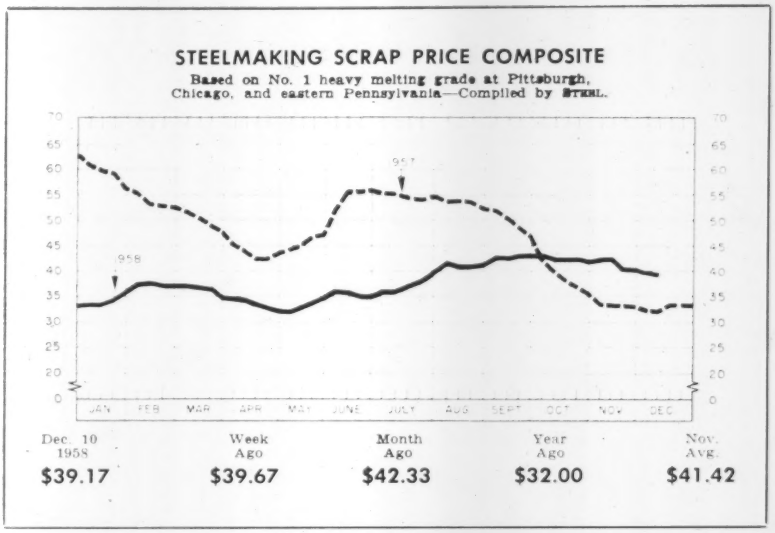

expected to back off soon. More activity in the foundry grades is reported.

Buffalo—The market is off about $2 a ton on mill purchases for December delivery. Buyers paid $28 for No. 2 heavy melting steel and $26 for No. 2 bundles. No. 1 heavy melting is quoted at $33-$34. Prices on railroad specialties, scrap rails, and low phos material declined $1 a ton. Cast scrap is unchanged.

St. Louis—The market is softer, largely because of easiness outside the area. There's not much activity here, and prices are off $1 a ton on the cast iron grades and some railroad items. Little tonnage is coming into this market, but the mills hold sufficient stocks to support production.

Cincinnati—Brokers are filling modest mill orders placed early this month. Buyers are being cautious. Consumers are ordering only what they need to support production schedules. No. 1 heavy melting is quoted by brokers at $36-$37.

Houston—With major consumers out of the market and all old orders filled, scrap sellers are marking time, awaiting January developments. Three export cargoes may be loaded at Gulf ports for Japan, but they will not create any new buying because exporters hold heavy accumulations. The Mexican market continues weak.

Supplies of cast iron scrap are outrunning demand, and a decline in prices is anticipated. On the broker level, steel scrap prices are untested, but with surpluses building up, new consumer buying is thought likely to bring lower prices.

Birmingham—The market continues slow. Open hearth steel consumers are not buying, but one large Birmingham electric furnace interest bought its December needs at $1 under the last quotation. Most of the pipe mills are out of the market, and those taking in scrap are paying $1 a ton less for it. The export market is quiet, but two ships are reported loading at Florida ports.

Los Angeles—Prices on No. 1 and No. 2 heavy melting steel have been marked up $3 a ton. Machine shop turnings at $13 are up $2 a ton. The market shows some signs of stabilizing, but the dealers are stil uncertain of the market trend over coming weeks.

San Francisco — Pressure for a price boost is building up here. Some dealers look for early announcement of a $4 per ton increase on the top grades. Spearheading the pressure is the recent Japanese purchase of 150,000 tons of steel grades.

Seattle—While the recent purchase of a number of full cargoes by Japan gave the market a little strength, sales continue slow. Large consumers have adequate stocks, and they are buying only occasionally. Prices are largely nominal, but dealers say the better grades are up $1 a ton.

Toronto—Settlement of the recent strike at the Hamilton Works of Steel Co. of Canada has been followed by an advance in Canadian scrap prices. Consumer buying continues sluggish; the mills are buying on a selective basis. Borings and turnings are not moving, but some small lots of heavy melting, bundles and busheling are being taken.

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Phone: Grovehill 6-2600

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Dec. 10, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 10	$39.17
Dec. 3	39.67
Nov. Avg.	41.42
Dec. 1957	32.77
Dec. 1953	36.69

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	33.00-34.00
No. 1 dealer bundles	41.00-42.00
No. 2 bundles	*27.00-28.00*
No. 1 busheling	41.00-42.00
No. 1 factory bundles	46.00-47.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	*47.00-48.00*
3 ft lengths	*46.00-47.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*47.00-48.00*
Electric furnace bundles	*47.00-48.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*
Rails, 2 ft and under	*56.00-57.00*
Rails, 18 in. and under	*57.00-58.00*
Random rails	*53.00-54.00*
Railroad specialties	*48.00-49.00*
Angles, splice bars	*48.00-49.00*
Rails, rerolling	*58.00-59.00*

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt, indus.	*43.00-44.00*
No. 1 heavy melt dealer	40.00-41.00
No. 2 heavy melting	*35.00-36.00*
No. 1 factory bundles	*46.00-47.00*
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	*43.00-44.00*
No. 1 busheling, dealer	40.00-41.00
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*23.00-24.00*
Short shovel turnings	*23.00-24.00*
Cast iron borings	*23.00-24.00*
Cut structurals, 3 ft	*47.00-48.00*
Punchings & plate scrap	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	52.00-53.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00-46.00*
R.R. malleable	*57.00-58.00*
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	69.00-70.00
Rails, rerolling	63.00-64.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	*45.00-50.00*

YOUNGSTOWN

No. 1 heavy melting	42.00-43.00
No. 2 heavy melting	29.00-30.00
No. 1 busheling	42.00-43.00
No. 1 bundles	42.00-43.00
No. 2 bundles	29.00-30.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	43.00-44.00
Electric furnace bundles	43.00-44.00

Railroad Scrap

No. R.R. heavy melt.	44.00-45.00

CLEVELAND

No. 1 heavy melting	38.50-39.50
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	38.50-39.50
No. 2 bundles	28.50-29.50
No. 1 busheling	38.50-39.50
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*39.00-40.00*
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos. punching & plate	40.00-41.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-215.00
18-8 turnings	115.00-120.00
430 clips, bundles, solids	110.00-120.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	*19.50†*
Short shovel turnings	*21.50†*

Cast Iron Gradee

No. 1 cupola	*48.00*
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	49.00
Stove plate	*45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	44.00
Rails, 18 in. and under	52.00†
Rails, random lengths	47.50
Rails, rerolling	59.50
Angles, splice bars	*47.00*

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	35.00-36.00
No. 2 bundles	21.00-22.00
No. 1 busheling	35.00-36.00
Cast iron borings	13.00-14.00
Machine shop turnings	*22.00-23.00*
Short shovel turnings	*23.00-24.00*
Bars, crops and plates	43.00-44.00
Structurals & plates	42.00-43.00
Electric furnace bundles	*38.00-39.00*
Electric furnace:	
2 ft and under	*36.00-37.00*
3 ft and under	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	*53.00-54.00*
Stove plate	*52.00-53.00*
Unstripped motor blocks	*40.00-41.00*
Charging box cast	29.00-30.00
No. 1 wheels	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-39.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	54.00-55.00
Rails, random lengths	44.00-45.00
Angles, splice bars	45.00-46.00

PHILADELPHIA

No. 1 heavy melting	*34.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*35.00*
No. 2 bundles	*22.00*
No. 1 busheling	*34.00*
Electric furnace bundles	37.00
Mixed borings, turnings	*18.00†*
Short shovel turnings	*21.00*
Machine shop turnings	*18.00*
Heavy turnings	33.00
Structurals & plate	38.00-40.00
Couplers, springs, wheels	42.00-43.00
Rails, crops, 2 ft & under	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable cast	41.00
Malleable	58.00
Drop broken machinery	48.00-49.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	27.00-28.00
No. 2 bundles	*17.00-18.00*
Machine shop turnings	9.00-10.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	33.00-34.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	23.00-24.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips solids	185.00-190.00
18-8 borings, turnings	85.00-90.00
410 sheets clips, solids	55.00-60.00
430 sheets, clips, solids	75.00-80.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	33.00-34.00
No. 2 bundles	25.00-26.00
No. 1 busheling	33.00-34.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	42.00-43.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 3 ft and under	53.00-54.00
Railroad specialties	42.00-43.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	*36.00-37.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	20.00-21.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	38.00-39.00
Charging box cast	*38.00-39.00*
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00-43.00*
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	40.00†
No. 2 heavy melting	34.00†
No. 1 bundles	40.00†
No. 2 bundles	25.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	45.50†

Cast Iron Grades

No. 1 cupola	45.00
Heavy breakable	27.00-28.00†
Foundry malleable	39.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	25.00-26.00
No. 1 busheling	25.00-26.00
Machine shop turnings	7.00-8.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.00-16.00*
Punching & plate	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*34.00-35.00*
Charging box cast	34.00-35.00
Heavy breakable	*35.00-36.00*
Unstripped motor blocks	*19.00-20.00*
Clan auto cast	*49.00-50.00*

SEATTLE

No. 1 heavy melting	*31.00*
No. 2 heavy melting	*29.00*
No. 1 bundles	*29.00*
No. 2 bundles	*23.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*35.00*
No. 1 bundles	30.00
No. 2 bundles	17.00
Machine shop turnings	*13.00*
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	*32.00-36.00*
No. 2 heavy melting	*30.00-34.00*
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

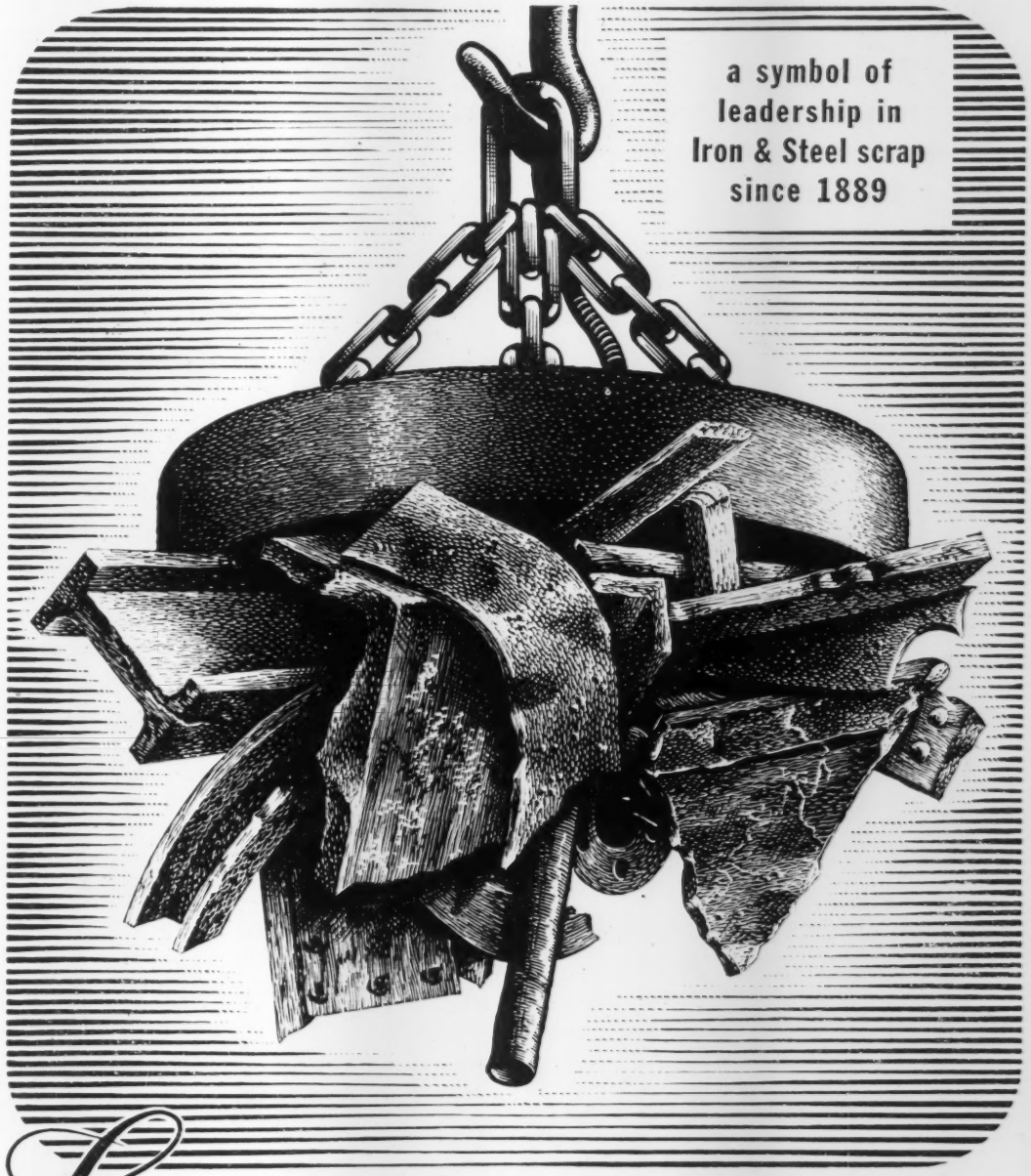
HAMILTON, ONT.

No. 1 heavy melting	*34.50*
No. 2 heavy melting	*30.50*
No. 1 bundles	*34.50*
No. 2 bundles	*25.00*
Mixed steel scrap	*26.50*
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	*34.50*
Unprepared	*28.50*
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	39.00-41.00

*Brokers' buying prices.
†Nominal.
‡F.o.b. Hamilton, Ont.



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EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

Lid Put on Aluminum Prices

Industry freezes present pig and mill product quotations until after June 30. Expect higher charges soon after that. Shipments and production on the upswing

Nonferrous Metal Prices, Pages 204 & 205

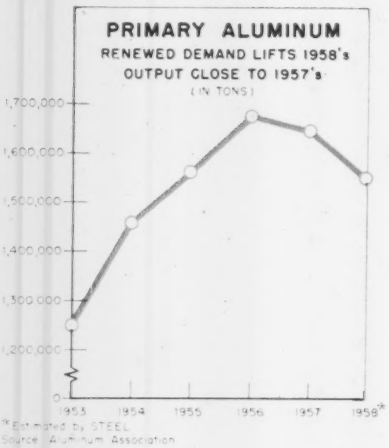
ANY PLANS to bump aluminum quotations were scotched on Dec. 5 when Aluminum Co. of America and Kaiser Aluminum & Chemical Corp. announced present price lists would apply to all products ordered and shipped before July 1.

The action squelches rumors that the industry would boost charges early in 1959 and brings up this question: Why would the industry take such a step when it's known that aluminum management would like to recover more of the 2-cent-a-pound price drop that went into effect last April? (Quotations were jumped 0.7 cent a pound on Aug. 1, but the industry was also hit with labor increases of 19 cents a pound at that time.)

• **Chronology**—Here's the step-by-step playback. It all started earlier in the month when Aluminium Ltd. Sales Inc. sent a letter to its customers announcing that the 60-day price protection clause on new orders would not be in effect after Dec. 31. Aluminium added that it would ship ingots at the current quotation through June 30 if orders were placed before the Dec. 31 deadline. The company said it made this move at the request of independent fabricators because "competitive practices have led price protection to defeat its intended purpose."

• **Unpopular**—Aluminium initiated the 60-day price protection clause in November, 1957. U. S. producers, who say they never wanted it, went along and on occasion have extended the protective period to 90 and 120 days. Some independent fabricators, particularly extruders, never did like the protection clause. Reason: They sometimes had to continue charging on the old basis for a time after their own price protection had run out.

Aluminium's move initially looked like it would still complaints of the independents and lay the groundwork for an early price rise. But the stipulation that shipments of ingots would be made through midyear at current prices held strong promise of touching off a buying avalanche.



• **Countermove** — Competition immediately responded. Reynolds Metals Co. was first with an announcement that it would offer price protection on ingots and mill products through June 30 if orders were placed in December. The next logical step was the announcements by Alcoa and Kaiser. Both evidently felt that only chaos would result if customers placed orders now based on the next half-year's requirements.

• **Pay More Later**—While prices can't move up now until midyear, it's a safe bet you'll be paying more for aluminum shortly after that. The reason's simple: Producers are getting 1.3 cents a pound less for pig now than they were in early 1957 even though total labor charges have risen 24 cents an hour in the interim. The current three-year labor contract ends during the summer.

• **Business Better**—On the brighter side, aluminum business is steadily picking up. October shipments of sheets and plates hit 54,915 tons, compared with 50,221 tons in September, reports the Aluminum Association. Total for the first ten months is 491,800 tons, vs. 544,144 tons in the same period last year. October foil shipments bettered the September figure 9340 tons to 8700. Totals for the first ten months are running ahead of 1957's: 79,410 tons, vs. 74,425 tons.

• **Production Rising**—U. S. primary output is on the upswing but will still fall short of last year's total by about 97,000 tons. STEEL predicts smelter production this year will be in the neighborhood of 1,550,000 tons, compared with 1,647,710 last year. Estimates peg 1959 output as falling between 1,800,000 tons and 1,875,000 tons.

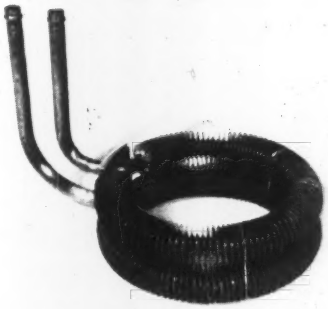
NONFERROUS PRICE RECORD

	Price Dec. 10	Last Change	Previous Price	Nov. Avg	Oct. Avg	Dec., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	28.50-29.00	Dec. 3, 1958	29.00	29.415	28.058	26.130
Lead	12.80	Oct. 14, 1958	12.30	12.800	12.473	13.300
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.25	Dec. 10, 1958	99.125	99.034	96.500	92.395
Zinc	11.50	Nov. 7, 1958	11.00	11.386	10.865	10.000

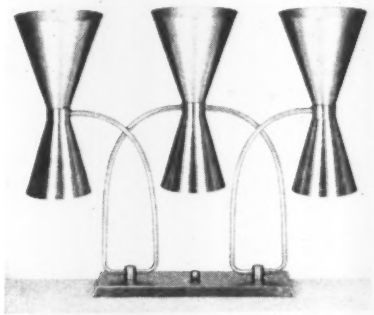
Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

BRIDGEPORT BRASS
COPPER ALLOY BULLETIN

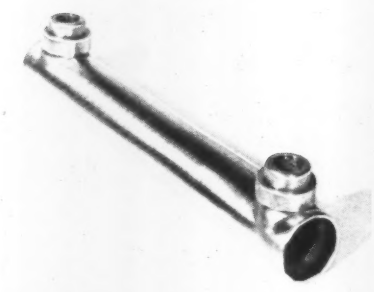
Bridgeport — Reporting New Developments in Copper-Brass Alloys and Metalworking Methods



Conductivity and fast, low-cost fabrication are important qualities Bridgeport tube supplies for parts like this finned copper tube defroster coil.



High quality surface finish and easy workability are specified and supplied by Bridgeport in tube used in modern lamps like these.



Ease of fabrication, heat conductivity and corrosion resistance make copper tube the ideal choice for parts like this automatic transmission cooling unit.

WHY IT PAYS TO FABRICATE WITH BRIDGEPORT SEAMLESS TUBE

Bridgeport brass and copper seamless tube is an unusually versatile metal form which has a host of qualities, characteristics and uses few other metals can provide. Used in lamps, andirons, automotive parts, cooling units, furniture and other items, it fills a wide range of product and production requirements.

Why Seamless Tube?

Fabricators select Bridgeport Seamless Tube for many reasons. Its beauty and warmth lend much to the appeal of consumer products, for example. And its corrosion resistance and rustproofness make it desirable where other metals fail. Another important plus factor of seamless tube is its easy workability. Machining, bending, forming, cutting and cupping all are easier. Its wonderfully smooth surface finish simplifies polishing and plating. Close OD, ID and wall-thickness tolerances are maintained. This simplifies fabricating, keeps costs down and insures more uniform end products.

Economy...

In addition to the fabrication savings mentioned, additional economies are realized with Bridgeport Seamless Tube because it is produced in long lengths to insure uninterrupted production runs.

Characteristics...

Still another advantage is the wide range of characteristics available. You can specify combinations of mechanical, physical and fabrication properties as well as tempers to suit every need.

And Quality...

Made in one of the country's most modern tube mills, Bridgeport tubes are checked and inspected at every stage of manufacture to assure adherence to specifications. Bridgeport's other tests cover surface finish, interior strength, accuracy of gage and diameter, chemical analysis, strain, expansion and microstructure.

Find Out More

...about Bridgeport Seamless Tube in a wide range of brass or copper alloys for use in fabricating. Our Technical Service Men can help you solve application problems. Just call your nearest Bridgeport Sales Office, or, if you prefer, write direct to Bridgeport Brass Company, Bridgeport 2, Connecticut, Dept. 3413.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 28.50-29.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $224-227 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for adition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $52-55 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 99.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 306, 32.25; No. 1 yellow, No. 405, 23.00; manganese bronze, No. 421, 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-10.50; forging billets, $3.80-4.35; hot-rolled and forged bars, $5.10-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire 21.00-21.50; No. 2 heavy copper and wire 19.00-19.50; light copper, 17.25-17.75; No. 1 composition red brass, 16.00-16.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 29.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	53.13b	50.36c	....	53.39	25.000	25.000	24.250
Yellow Brass	46.57	31.22d	47.11	49.98	17.000	16.750	15.250
Low Brass, 80%	49.23	49.17	48.87	52.54	21.250	21.000	20.500
Red Brass, 85%	50.17	50.11	50.71	53.48	22.125	21.875	21.375
Com. Bronze, 90%	51.65	51.59	52.19	54.71	22.875	22.625	22.125
Manganese Bronze	54.98	48.58	59.08	....	17.750	17.500	16.875
Muntz Metal	49.35	44.66	....	....	17.875	17.625	17.125
Naval Brass	51.24	45.05	57.80	54.65	17.625	17.375	16.875
Silicon Bronze	58.27	57.46	57.81	75.95	24.625	24.625	23.625
Nickel Silver, 10%	62.20	66.60	64.03	....	23.875	23.625	11.937
Phos. Bronze	72.59	73.09	72.59	74.27	25.875	25.625	24.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.00-15.50; new brass clippings, 14.25-14.75; light brass, 10.50-11.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.00-12.50; auto radiators, unsweated, 12.50-13.00; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Heavy, 8.25-8.75; battery plates, 3.00-3.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 31.00-33.00; old sheets, 28.00-30.00; turnings, 22.00-24.00; rods, 31.00-33.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.50-13.00; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 16.00-16.50; segregated high copper clips, 15.00-15.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.50-15.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.00; mixed low copper clips, 13.00-13.50; mixed high copper clips, 12.00-12.50.

REFINERS' BUYING PRICES
(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.50; light copper, 20.25; refinery brass (60% copper) per dry copper content, 22.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.50; light copper, 20.25; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators, 15.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45. **Copper:** Flat-rolled, 46.79; oval, 45.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities. **Nickel:** Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb. **Tin:** Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00. **Zinc:** Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums. **Chromic Acid (flake):** 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50. **Copper Cyanide:** 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90. **Copper Sulphate:** 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65. **Nickel Chloride:** 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00. **Nickel Sulphate:** 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00. **Sodium Cyanide (Cyanobrik):** 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80. **Sodium Stannate:** Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80. **Stannous Chloride (anhydrous):** 25 lb, 153.20; 100 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 105.00; 20,000 lb or more, 98.90. **Stannous Sulphate:** Less than 50 lb, 138.40; 50 lb, 108.40; 100-1900 lb, 106.40; 2000 lb or more, 104.40. **Zinc Cyanide:** 100-200 lb, 59.00; 300-900 lb, 57.00.

Britain's Restrictions On Scrap Exports Eased

The British government lifted restrictions on most scrap metal exports for two months beginning Dec. 5. Exceptions are armament scrap and stainless steel and other alloys worth more than $70 a ton. An open general license for exports of scrap has been issued and will be valid until Feb. 4. The future of scrap exports will be considered next year. A member of Parliament, Sir Peter Roberts, criticized the scrap licensing system, stating there had been a loss of about $40,400,000 in exports in the last four months.

Moves Grinding Wheels Div.

United States Rubber Co., New York, is moving its Grinding Wheels Div. from Ft. Wayne, Ind., to 10 Eagle St., Providence, R. I., and will discontinue its Ft. Wayne operation around the end of the year. New facilities in Providence will handle the manufacture of resin and rubber bonded grinding wheels.

AEC Alters U308 Buying

The Atomic Energy Commission has modified its 1962-66 uranium concentrate purchase program. It will continue to buy acceptable U308 concentrates at $8 per pound through the period if the ore reserves were developed before Nov. 24, 1958.

CLASSIFIED ADVERTISING

Help Wanted

STRUCTURAL ENGINEER
Structural steel designer and estimator for industrial buildings and miscellaneous steel structures, as well as steel plate fabrication. Applicant should be graduate engineer, preferably 30-40 years old, with minimum of 5 years actual structural steel design experience. Permanent employment, paid vacations, group insurance plan. Excellent opportunity. Location Mid-Continent. Good Schools. Employer is nationally known, well established steel fabricator. Reply fully, giving resume of experience, education, age and salary requirements to Box 709, STEEL, Penton Building, Cleveland 13, Ohio.

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For Seamless & Welded Steel Tubular Products. Steel Mill Products. Bars—Structural Steel—Plates—Sheets—Wire Products—Specialties. To call on Jobbers—Warehouses—Fabricators. Following States Available: Georgia—Carolinas—Kentucky — Virginia — Ohio — Indiana — Pennsylvania—New York—New England—Kansas—Missouri—Illinois Area. Must be experienced —have car— and reside in territory covered. Write Box 708, STEEL, Penton Bldg., Cleveland 13, Ohio, with references.

SUPERINTENDENT
To manage shop for structural steel fabricator and vessel builder in East. Must know metal fabricating, machining and all kinds of welding processes. Engineering training preferred. Requires energetic person with leadership ability and cost consciousness. Employes 150 shopmen. Unusual opportunity—salary open. Send resume to Box 713, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Experienced in general machine practice and press shop. Knowledge in foundry operations desirable but not necessary. Lancaster, Penna. Send resume, availability and salary desired to Box 715, STEEL, Penton Bldg., Cleveland 13, Ohio.

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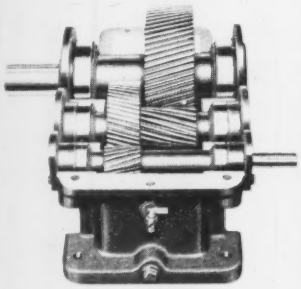

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TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly

Allison-Campbell

ABRASIVE CUTTING KNOW-HOW

ACCO for Better Values

Proper Use of Coolant Means Better Abrasive Cutting

• Wet abrasive cutting eliminates burning, minimizes burr, and gives a finer finish than any other cut-off method—and the key to this quality is proper coolant application. Here are the three essentials of adequate cooling:

1. Volume of coolant, rather than pressure, must be kept at a high level for maximum wheel life.
2. Coolant must be accurately directed to the *point of contact* between the wheel and the work, because this is the point at which most heat is generated.
3. Coolant must be applied equally to both sides of the wheel to avoid crooked cuts and wheel breakage.

Radial holes in ALLISON wheels carry coolant deep *inside* the cut itself. This extra cooling action assures clean cuts and maximum wheel life on solids from 2" to 12" round or square. These holes also impart a self-dressing action to the wheel, keeping sharp grits exposed for cool, fast cutting.

Allison-Campbell Design Assures Proper Cooling

High volume of coolant is provided by a large reservoir and an extra-capacity coolant pump.

Good distribution of coolant is assured by a coolant distributor, standard on all CAMPBELL machines. This can be adjusted and locked in position to provide equal distribution of coolant to both sides of the wheel and to the work.

High-speed, quality cuts on almost *any* material are possible with modern abrasive cutting techniques. Your ALLISON-CAMPBELL Field Engineer will be glad to recommend the right machine and wheels for *your* cut-off jobs. Call on him for help.

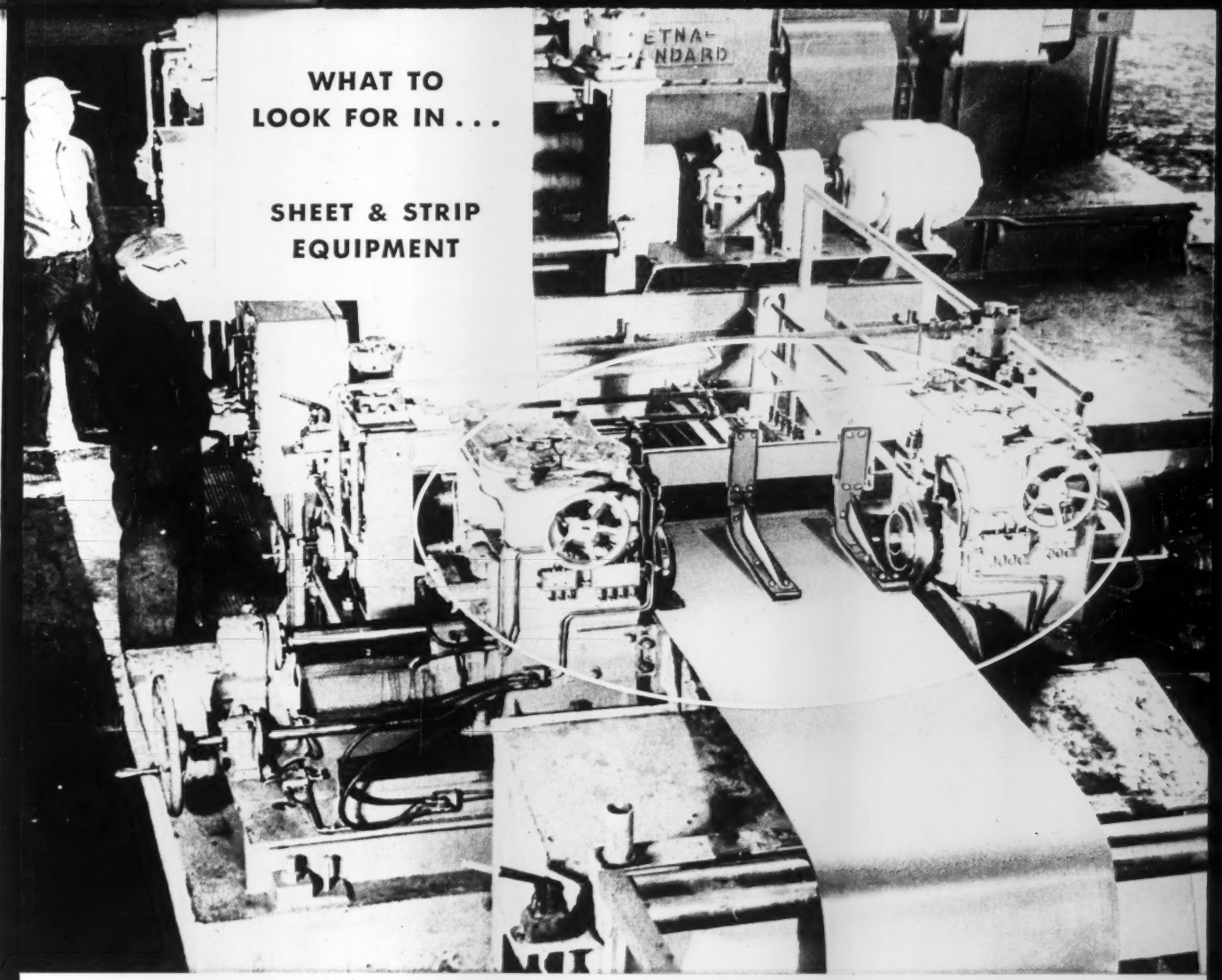
A complete selection of machines and wheels for *any* cut-off application is offered by ALLISON-CAMPBELL. Four types of CAMPBELL machines—chop stroke, oscillating, horizontal, and rotary—in capacities from the smallest stock to 14" rounds . . . billets up to 12" square . . . plate up to 6" thick and 20 ft. long. ALLISON wheels—more than 150 different specifications—rubber or resinoid bond—3" to 34" diameters—.006" to 3 /16" thick.

Write for a copy of DH-20, a new bulletin describing the ALLISON-CAMPBELL Demonstration Laboratory, and how you can take advantage of the special services it offers. Complete details on ALLISON wheels and CAMPBELL machines are also available.

ALLISON-CAMPBELL DIVISION
AMERICAN CHAIN & CABLE

921 Connecticut Avenue, Bridgeport 2, Conn.

ACCO



there's a DIFFERENCE in SLITTERS . . .

Easy Adjustment

Each top spindle arranged for vertical adjustment.

Each spindle can be accurately set by screw adjustment for knife-side clearance.

Micrometer adjustment by worm and gear reduction in setting the vertical knife clearance.

Housings can be adjusted for various widths of strip.

Positive right-angle alignment of the rotary knives with strip.

Handwheel adjustment for upper chuck located where operator can see knife clearance.

Easy Operation

All spindles driven by single helical gears of heat-treated alloy steel.

On many sizes, housings of high-speed tin-plate side trimmers tilted to assure side scrap removal from strip, preventing scrap cobbles.

Maintenance

Bearings serviced by centralized lubrication.

Improved oil seal arrangement provided for trimmer housings.

Good Construction

All internal parts housed in two cast-steel housings with oil seals to retain bearing lubricant.

Knives of high-carbon, high-chrome forged steel of double-edge reversible type.

Spindle housings and drive carried on heavy welded structural steel base.

Two-point support included for each upper chuck.

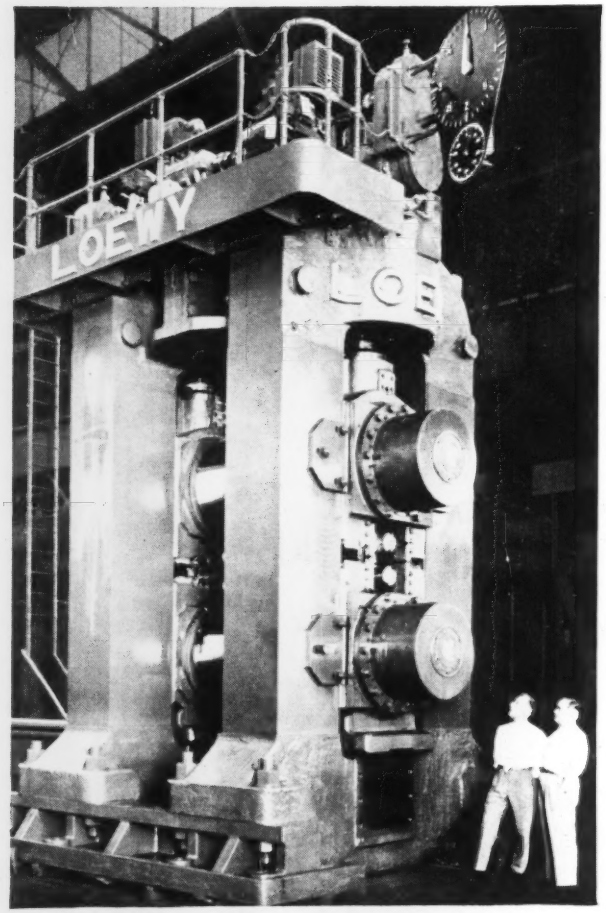
Mill-type shoe design assures proper alignment of housings for trimmer.

Four driven spindles of alloy steel forgings carried in two double rows of anti-friction bearings.

AETNA•STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • PROCESS LABORATORY: AKRON, OHIO



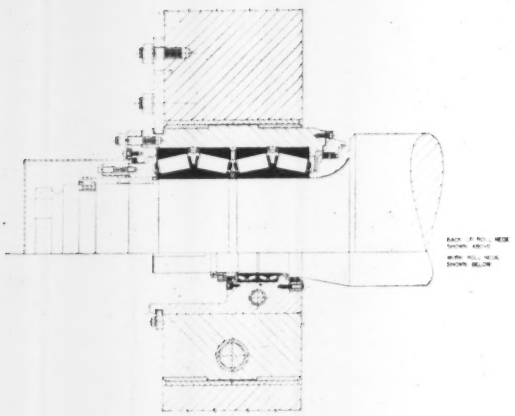
Rolls up to 20″ x 20″ the "hard" way... Timken® bearings take the shock

THIS powerful 4 Hi reversing mill, built by Loewy-Hydropress Division of Baldwin-Lima-Hamilton Corp., is doing its job the "hard" way—rolling small slab ingots of special hard alloys up to 20″ x 20″. To roll them down to .010″ or less takes a lot of force. It's hard work. This mill operates at a separating force of 140,000 lb. per inch of width—at speeds from 75 to 200 fpm. To take the heavy shocks, keep bearing cost down, Timken® tapered roller bearings are used to mount the back-up and work rolls, screwdown drive and screwdown worm gear. 24 Timken bearings all told.

Here are the big reasons why 1008 steel mills use Timken tapered roller bearings on roll necks:

1. Longer life. Tonnage records show that the long life of Timken roll neck bearings keeps bearing cost per ton of steel rolled at rock bottom. **2. Better mill rigidity.** Balanced proportion design of Timken bearings permits larger roll necks than ever before possible with tapered roller bearings. Load ratings are increased up to 40% due to Timken bearings' balanced proportion design. **3. Simplified lubrication.** No complicated systems; Timken bearings permit use of simple grease lubrication. **4. No special thrust bearings needed.** Timken bearings take *both* radial and thrust loads. **5. Steel loss ended in mill stops and starts.** Timken bearings permit starting under full loads. **6. Faster mill rolling speeds** because Timken bearings minimize friction.

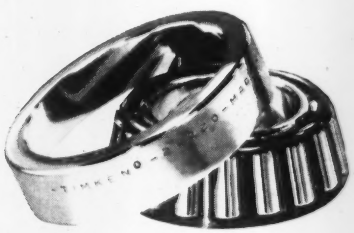
Timken bearings make any machine better. And better machines make better products. That's Better-ness. And the trade-mark "TIMKEN" is your symbol of Better-ness. Look for it. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



How **LOEWY-HYDROPRESS** mounts rolls of this 12 x 43 x 42 mill on Timken bearings to take shocks, assure longest, most economical life.

TIMKEN ROLLER BEARING EQUIPPED

This symbol on a product means its bearings are the best.



BETTER-ness rolls on TIMKEN tapered roller bearings